DECEMBER 1982

COMPUTER DECISIONS®

THE MANAGEM 'T MAGAZINE OF COMPUTING

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OA in
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Executive
workstations

Quest for
more storage

Software
wrap-up

IBM–1983
and beyond

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THE MANAGEMENT MAGAZINE OF COMPUTING DECEMBER 1982

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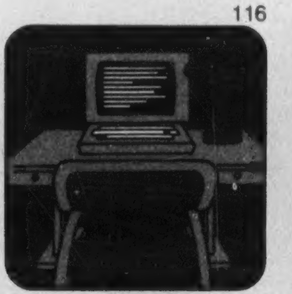

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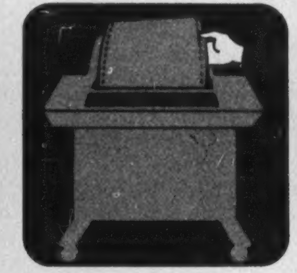

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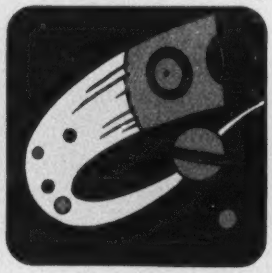

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COVER PHOTO: Edward Hardin

SELECTIVE OFFICE AUTOMATION

Photo by Bill Oliwa

by Julia G. Brown, Southwestern Editor

Survival tactics during a prolonged recession range from doubling an advertising budget to eliminating it; from staff reductions through attrition and hiring freezes to massive layoffs; from calling a halt to all capital spending to trimming fat out of the budget. The final picture usually resembles a recruit after basic training: lean and efficient, with the knowledge and economy of motion necessary to survive in the jungle out there.

Is it really necessary to be combat ready to weather the recession? Maybe not. But unless you use every possible means of increasing the efficiency of your operation—thereby saving time and cutting costs—yours could become one of the thousands of businesses going under each month.

That's where office automation comes in. In labor-intensive service businesses, it could mean survival. The term covers a broad range of solutions for boosting the efficiency of almost every business function imaginable. A $3 billion industry, office automation runs the gamut from automatic postage meters to fully integrated, minicomputer-based, distributed dp/wp systems.

As the MIS/dp manager, you are most likely one of the persons the boss will turn to for meaningful advice on this broad subject. Case histories and hints from the experts may help you to apply some of the OA concepts to a division in your own company. (See "You *can* cut costs" in the September 1982 issue for more cost-saving ideas.)

One point to remember when looking for ways to automate is that old technology—a stand-alone word processor, for instance—can be considered new to a regional office that still uses electric typewriters exclusively. No two offices' needs are alike, even within the same company. Increasing efficiency in a particular department may be as simple as installing a postage meter—depending on who licks the stamps.

While you are considering how time-saving automation may improve your survivability, keep in mind the possible effects of the recession on the office-automation industry. (Watch for the results of our survey on long-term vendor survivability in the January and February 1983 "Office automation" columns.)

"The recession has had a huge effect on office automation," according to N. Dean Meyer, a Ridgefield, CT, management consultant specializing in OA. "It has stalled the industry's progress to the point where all 1985 projections will have to be readjusted over the next couple of years to reflect the slow recovery.

"The recession has also accelerated the 'shakeout' of vendors," Meyer adds, "driving some of them into bankruptcy. We'll see a sifting out of smaller, less viable companies. And even the large vendors, like IBM and Xerox, are restructuring."

John J. Connell, executive head of the Office Technology Research Group, a Pasadena, CA-based association of OA experts from large organizations, cited a related effect

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Achieving savings through office automation needn't entail a company-wide equipment overhaul; it may be as simple as installing a stand-alone word processor in one department.

of the recession: "It has stopped all OA efforts that originated at lower levels of management; only those with strong backing from top management are surviving. . . .Any OA projects assigned to MIS/dp are also languishing. They're being treated like just another project."

Thus, vendor problems are due, in part, to potential users delaying automation. The economy is forcing them to establish more detailed cost-justification for automating, and "some of the most highly praised applications won't stand up under such close scrutiny," says Robert A. Becker of Rabeck Inc. (Montclair, NJ), a consultant to businesses considering office automation. "Like in all facets of enterprise, potential users—and vendors—will have to spend more time substantiating the cost-justification for what they are proposing," Becker adds.

With money so tight, "if you're going to do anything at all," Meyer says, "it has to save hard dollars." So far, in the '80s, the trend in office automation has been toward increasing the effectiveness of managers, Meyer points out, while in the '70s the emphasis was on making the clerical and support functions more efficient. With the current focus on savings, and documenting this savings, the experts say automation will shift back toward the clerical and support functions where productivity and efficiency are easier to measure in dollars.

The price is right

Yet even with this bleak economic picture, it seems everybody wants to get into the OA act—new vendors as well as established manufacturers. And as microprocessor technology becomes more and more refined, costs of sophisticated office systems will continue to drop.

According to Adam Osborne, maker of the personal computer that sells for only $1,800 with a lot of useful software, those price drops will upset all plans for office automation because microcomputers are so inexpensive. On the other hand, Esther Dyson, an analyst with Rosen Research in New York, reports that users are finding personal computers ". . . tougher to use than realized. They're surprised that they have to spend so much time learning how to use them. And the machines are being oversold, so executives expect too much from them. However, there are enough micros in offices so that managers are taking them seriously."

Depending on how an MIS/dp manager approaches the infiltration of personal computers into his organization, they can be considered either a boon or bane to overall efficiency. On the one hand, Becker observes, "you can wind up with scattered equipment and no compatibility." On the other, Meyer points out, if OA is considered to be "putting computing in end users' hands, it is a tremendous boost to [MIS/dp managers] who want to move toward integration while helping end users to be effective."

Microcomputers do take power

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(Continued from page 129)

away from information-systems czars who want to control users for the sake of technical efficiency, Meyer adds, "But if the goal is usefulness, micros, which are cost-effective, user-oriented, and integrable, fit the bill," he says.

Office functions, such as word processing, are commonly available on popular personal computers. However, consultant Thomas Billadeau claims that the quality of word processing on personal computers falls far short of the quality of wp on much more expensive machines dedicated to this function. And instead of personal computers, some executives may opt for so-called executive workstations, which require less memorization of computer commands.

Becker indicates that "some sort of integrated activity" is what most managers in charge of office automation are seeking. Yet, if users are demanding computing power at their own desks in addition to shared databases, files, and printers, then a networking capability is important.

Rob McGhie, senior materials specialist for the Houston offices of a Saudi-based oil company, credits his department's "fully integrated" system with reducing its order-reject rate to 2 percent; the company average is 10 to 15 percent.

Nestar Systems Inc. (Palo Alto, CA), offers exactly this capability in its new networking system, Plan 4000. According to the vendor, Plan 4000 is a high-performance baseband system that supports any combination of up to 255 IBM Personal Computers, Apple IIs, and Apple IIIs. Nodes on the network can be up to 20,000 feet apart and can communicate at a rate of 2.5 megabits per second with each other, with shared resources such as printers or storage disks, and with mainframes via IBM 3270 and 3780 protocols.

Other "hot" OA technologies include electronic-mail and voice-messaging systems; electronic filing and retrieval systems; ergonomics; local-area networks and data communications in general; and optical-character-recognition (OCR) equipment as input devices for not only word processors but also for Telex and mass storage.

OCR equipment can simplify input of information on a word processor because it eliminates keyboarding of a document. Some scanners, such as the Compuscan Alphaword III+, come with keyboards for corrections and revisions to be made as pages are read. Some, like the Hendrix Tele-Typereader, have a separate keyboard and crt for corrections as well as for programming or teletype-transmission preparation.

(Continued on page 134)

OA raises productivity

One of two new surveys on office automation shows that implementation of automated systems in offices can raise the productivity of white-collar workers by 10.3 percent. However, the same survey shows that human-resource development increased productivity 10.5 percent among 99 large corporations. The second survey polled female office workers on various issues associated with automation.

The first survey, conducted by the American Productivity Center in Houston, and sponsored by Steelcase Inc., was sent to 600 corporations. The 140 responses represented a broad cross-section of manufacturing, energy, and service organizations.

The survey indicates that implementation of productivity-raising programs is not easy. Planning and implementation take an average of six to 12 months. It takes about six months for "quality circle" and team-building techniques to pay for themselves; about a year for automated systems; and 18 to 24 months for environmental and design changes.

The second survey—sponsored by Verbatim Corp., a leading supplier of magnetic storage media—was conducted among 1,263 office workers in large, medium, and small companies throughout the United States. A majority (68.2 percent) of those responding to the 104-item questionnaire expressed concern about health problems that could result from prolonged use of word processors. Eyestrain was the most common complaint (63.4 percent), followed by backstrain (36.3 percent). More than 79 percent called for better lighting for those working with automated machines, and 78.8 percent favored periodic rest breaks.

As in the first survey, responses to the Verbatim survey indicated that automated equipment increased productivity, with word processors rated highest (followed by copiers, minicomputers, electronic typewriters, and dictation/transcription units).

Nearly half of those responding agreed that fewer demeaning tasks are expected of wp operators than of secretaries. However, nearly four in 10 respondents doubted that wp operators had a higher job status than secretaries.

To obtain copies of the results of these surveys, write to: Steelcase, Productivity Reports, Grand Rapids, MI 49501; and Verbatim, Corporate Communications Dept., 323 Soquel Way, Sunnyvale, CA 94086.

Office Automation

(Continued from page 130)

OCRs, as one user discovered, can open up input bottlenecks in a word-processing department. At Jenkins & Perry, a general-business law firm in San Diego, 10 secretaries, using four IBM Displaywriters, handle work for 22 lawyers. When the flow of information became intolerably slow, Patricia Lane, word processing manager, purchased a model 5300L optical character reader from ECRM (Bedford, MA), a division of AM International Inc.

"Each secretary has an IBM Selectric," Lane says, "which now gives us, in effect, 10 additional wp input stations."

The secretaries type drafts from dictated tapes, says Lane. These drafts are fed into the OCR and either sent to a word processor or to archival storage to be called up later.

While the draft is being fed through the OCR, a lawyer can simultaneously look at and revise a copy of the draft. The secretary then makes these revisions on the word processor.

After installation of the page reader about 18 months ago, the number of lawyers at Jenkins & Perry grew to 32 (it's now down to 25), but there was no need to add secretaries to keep up with the work.

Low-cost, high-speed laser printers, to which many input or archival stations can be tied, will be used in more and more offices. This laser printer is the LPS-12 from Wang Laboratories.

"The OCR reduced processing time by 60 percent because the secretaries no longer had to wait to use a word processor," says Lane.

The ECRM 5300L has floppy-disk drives for offline storage, and can interface with several makes of word- and data-processing equipment. Lane says that her decision to purchase the ECRM equipment was based in part on this interface capability. However, the firm's Qantel dp system delayed transmissions by six seconds per line, so the plan for a dp interface was dropped. "It's not as important to us as the word-processing connection," Lane adds.

The Prime 2250, a 32-bit mini designed especially for the office by Prime Computer, can support up to 32 terminals. Via Primenet, the 2250 can communicate with other Prime computers; it can also communicate with mainframes. Cost of the 2250 ranges from $39,900 to $48,900.

To each his own

Perhaps wp inputting isn't the worst bottleneck in your office. If too much time is spent searching through files for every bit of information on a certain subject, then you might want to automate filing and retrieval.

Systems analyst Ben Adams (a pseudonym) is primarily concerned with the file-retrieval aspect of his New York-based company's pilot office-automation program. Other functions being explored at the subsidiary of a Fortune 500 manufacturer include electronic mail, calendaring, and word processing.

"We chose the Burroughs Ofisfile because it could be used as a stand-alone filing-and-retrieval system, or as a shared resource via our host computer," Adams says. "Also, because it is text-oriented, and compatible with any equipment that uses standard asynchronous communications, the Ofisfile is extremely flexible in an integrated-system arrangement—and very easy to use."

"Text-oriented," Adams explains, means a user simply keys in a phrase, in plain English, describing what information in which file should be retrieved. The system then searches for that information and displays the requested documents, in sequence, on the screen. "With Wang and Datapoint systems," Adams says, "you have to first call up an index to make a selection; then it takes a second command to get the information."

Although the Ofisfile was installed just six months ago, Adams seems pleased with the early results. Possibilities for new applications are continually surfacing, Adams says. But the major time-saving benefits are already apparent, with an overall reduction in four areas:

- *Paper handling and storage.* The system stores as many as 80,000

Don't forget stand-alones

Many vendors stress "totally integrated" office-automation systems, but stand-alone equipment can still save money and space and increase efficiency. For example, Microfilmers, like this Kodak Reliant 800, can be used for filing and storage of documents. Other stand-alone systems worth investigating are computerized phone-management and control systems, which can cut phone charges by 40 percent; computer control of copiers by means of credit-card-like activation devices; and computerized time-control systems that eliminate the keypunching required by traditional time cards.

typewritten pages in the space of a two-drawer file cabinet.

- *Search time.* When the entire system is used as the only office file, it still takes far less than a minute to locate requested information and queue it up for display on the screen.
- *Distribution costs.* When Ofisfile is used as a shared resource, via the main cpu, memos and correspondence can be copied into other users' files.
- *Use of outdated information.* Potentially costly errors caused by using outdated information are reduced because file updating is so fast and easy.

These benefits notwithstanding, the electronic-filing concept is still considered avant-garde by many experts. And even Adams concedes there is room for improvement. But if information filing and retrieval is wasting hours of staff time—executive and clerical—a system like Ofisfile (even with its hefty $59,000 price tag for the basic unit) could pay for itself—in time saving alone—

Users rank word processors

This chart shows how 1,937 users rate 21 of the most widely used word processors according to nine important factors. From the chart, it is possible to determine how individual systems were rated by users. For instance, ease of learning is indicated as Lexitron's forte; service and support show up as Wang's weak spots; and price/performance is pointed to as Digital Equipment's strong point, though the company was rated low on training. The 14 vendors in five groups were arranged based on the descending order of their rating for

Rank		Machine	Vendor	Total weighted rating	Productivity	Ease of learning	Human engineering
1982	1981						
1	1	Micom 2000/1	Phillips	334	3.62	3.40	3.20
2	*	Dual Display	Dictaphone	325	3.50	3.30	3.21
3	5	3000 System 1/2	NBI	324	3.57	3.33	3.10
4	10	Magna SL	A.B. Dick	323	3.44	3.44	2.90
5	*	Shared System	Lanier	313	3.32	3.32	2.93
6	3	1200/02/1303	Lexitron	311	3.19	3.76	3.20
7	7	No Problem	Lanier	300	3.30	3.34	3.00
8	4	8000	CPT	297	3.33	3.11	2.85
9	12	WS 78	Digital Equipment	297	3.10	3.29	3.00
10	15	01S 125/130/140	Wang	296	3.34	3.46	3.03
11	11	OS/6	IBM	293	3.27	2.54	2.55
12	20	J100/J500	AM Jacquard	290	3.24	3.10	2.71
13	*	5520	IBM	289	3.27	2.80	2.65
14	18	WPS 5	Wang	284	3.24	3.24	3.06
15	*	Displaywriter	IBM	282	3.04	2.70	2.90
16	9	850/860 Page Display	Xerox	281	3.10	2.74	2.80
17	21	WPS 20/25/30	Wang	280	3.20	3.36	3.00
18	*	LTE-½	Lanier	279	3.00	3.30	2.88
19	8	Redactor II	Burroughs	276	3.15	2.54	2.70
20	19	Amtext 425	AM Jacquard	271	3.00	3.10	2.60

Rating scale: 4—Outstanding 3—Good 2—Satisfactory 1—Needs improvement

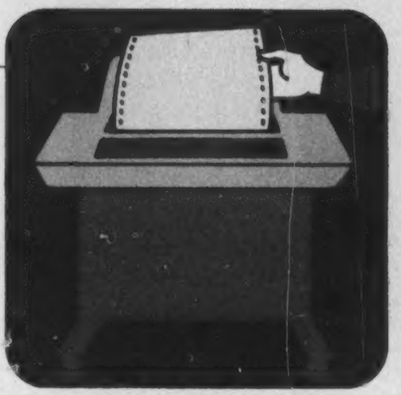
*Not ranked in 1981.

within just a few years.

The Burroughs Ofisfile is part of a completely integrated office-automation system called Ofis 1, which includes facsimile machines, terminals, word processors, controllers, OCRs, and desk-top printers, as well as the online filing-and-retrieval system. Another automated filing/retrieval system you may want to investigate, once you decide to take the plunge, is micrographics. Although document retrieval is often slower and more complicated with micrographics, the space savings it proffers make it an option worth considering.

Experts say automation will shift back toward clerical functions, where productivity is easier to measure in dollars.

One of the most controversial topics in OA is local-area networks (LANs), with the prime contenders being broadband and baseband. (See "Local networks: Making the right connection," *Computer Decisions*, June 1982.) Both require installation of coaxial cable. But before you get caught up in the debate over the relative merits of either type, consider instead the possibility of using your existing telephone lines and one of the new voice/data-switching devices—computerized PBXs.



"In many installations," Becker says, "telephone wires are adequate; however, certain PBXs require special cables."

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each feature. Each feature was assigned a weight, which, when multiplied against each specific respondent rating, was used to compute the "Total Weighted Rating" shown here for each system.

This listing comes from a special issue of a monthly newsletter, Advanced Office Concepts (copyright 1982 by Advanced Office Concepts Corp., 1 Bala Cynwyd Plaza, Bala Cynwyd, PA 19004, 215-667-5993). Copies of the complete report from which this listing was extracted are available for $35 each.

Price/ performance	Prompt/ efficient service	Operator training	Publications	Assistance with problems	Overall system capabilities	Respondents No.	%
3.34	3.40	3.02	2.80	3.20	3.60	47	4.5
2.93	3.21	3.21	2.80	3.40	3.40	14	1.3
3.00	3.13	3.00	2.80	3.20	3.60	83	7.8
3.11	3.40	3.11	2.80	3.40	3.20	18	1.7
2.71	3.30	3.11	2.54	3.20	3.40	28	2.7
2.90	3.12	3.00	2.52	3.10	2.93	42	4.0
2.80	3.00	2.90	2.51	2.94	2.91	35	3.3
2.60	3.02	2.84	2.21	2.90	3.31	61	5.7
3.20	3.04	2.33	2.50	2.90	2.90	24	2.3
3.00	2.70	2.42	2.31	2.50	3.21	125	11.8
2.63	3.10	2.50	2.30	3.80	3.10	114	10.8
3.00	2.94	2.80	2.30	2.50	2.90	17	1.6
2.65	3.00	2.60	2.51	2.84	3.20	37	3.5
2.70	2.70	2.35	2.24	2.20	3.10	17	1.6
2.70	3.10	2.30	2.60	2.81	2.90	80	7.6
2.80	2.90	2.45	2.33	2.70	2.90	115	10.0
2.81	2.40	2.36	2.10	2.21	3.00	90	8.5
2.65	2.82	2.60	2.24	2.50	2.80	34	3.2
2.62	2.62	2.80	2.54	2.85	2.80	13	1.2
2.74	2.70	2.60	2.22	2.41	2.63	22	2.6

Office Automation

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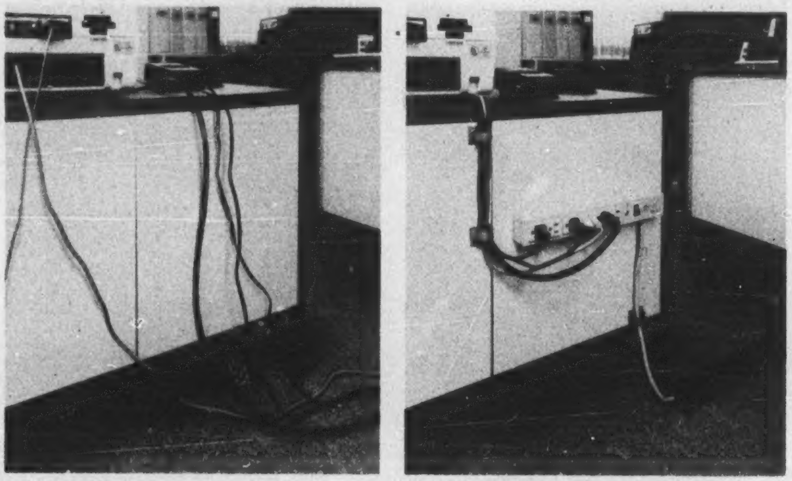


Adding office-automation hardware to an old office without proper power and communications cabling? To avoid the haphazard—and unsafe—wiring shown at left, use cable managers, power strip, and cable bridge available through Inmac, Santa Clara, CA.

Taking advantage of the proper switching technology is crucial, Becker adds, "especially with digitizing. If an office has a lot of machines, it could overload phone wires."

Meyer envisions one video conference room per establishment, or per division in large organizations, at the most. "Installing broadband cable throughout a facility could be overkill," he says, especially since installation charges are usually by the foot.

To help you wade through the communications contention of Wangnet, Ethernet, Decnet, Arcnet, etc., the Yankee Group in Boston offers a new service called Office Automation Systems Implementation and Strategies. It will provide clients with regularly updated information on developments in OA, with special emphasis on communications.

Communications processing is one of five functional areas, as defined by the Yankee Group, that may be automated by an office or business. The others are utility processing, which "bridges the corporate host computer to the workstations"; peripherals, local networks, and user workstations.

Some organizations have to take a so-called "total-systems" approach to office automation because so many different functions are crying for increased efficiency. Besides the Burroughs Ofis 1 system, there are the standbys from IBM, Wang, Datapoint, Xerox, Hewlett-Packard, Motorola, and Data General. And each month more vendors are coming up with integrated office information systems.

Saving time and cutting costs were two considerations for Rob McGhie, but they had to be combined with sophisticated communications capabilities—including handling four different protocols.

After "pushing the idea for years," McGhie, senior materials specialist in the Houston offices of a Saudi-based oil company, was finally able to install a "totally automated" office system in August 1981. "We integrated all our applications," McGhie says, "from word and data processing to Telex and communications."

Explore OA

Considering some form of office automation? Then you might want to check out the 1983 Office Automation Conference, February 21-23 at the Civic Center in Philadelphia. The theme for the conference, which includes seminars as well as exhibits, will be "Explorations in Office Automation." More detailed information can be obtained from the American Federation of Information Processing Societies, 1815 N. Lynn St., Arlington, VA 22209, (703) 558-3617.

Forty-eight Four-Phase terminals also act as remote-job-entry and timesharing stations to the IBM 3033 in the Houston office. They communicate via Telex switching and/or satellite to the 3033 in The Hague, The Netherlands, as well as to 370s and 3033s in Saudi Arabia.

"Next to drilling for oil, construction of our own refineries and new plants is our major activity," explains McGhie. With a multibillion-dollar expansion program under way, he says, the materials-management aspect of project management becomes extremely complicated. "Traditionally, the major contractors who design our plants used their own computers for everything," says McGhie. "Interfacing had to be done manually, and the charges were passed on to us.

"Now the contractor for the project I'm working on is using our two Four-Phase Model IV/90s for word processing, Telex, materials requests . . . everything. All the input and maintenance are done by the contractor's employees, but on our computers."

Besides the elimination of chargeback costs for computer time, McGhie reports that there has been a considerable reduction in rejected materials orders sent to Saudi Arabia. "The stock catalog, which covers nearly half a million items, is updated every two weeks. Orders for materials are input daily from all over the world. Ten to 15 percent of these are rejected in other offices. Our reject rate is only 2 percent for this project," boasts McGhie.

McGhie's staff edits materials orders, using the files they've updated on the local cpu. "The reduced reject rate means the contractor spends less time waiting for the right materials—or replacing the wrong

(Continued from page 140)

Sperrylink, the new office-automation system from Sperry, is aimed at medium-to-large organizations. Word and data processing, personal computing, electronic mail, and voice store-and-forward are among the possible functions. Sperrylink also emulates IBM 3270s. A basic Sperrylink system for an office occupied by 30 people costs $277,000.

ones," McGhie explains.

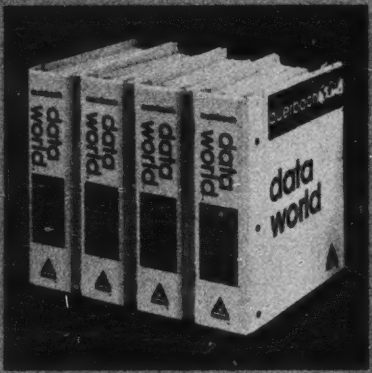
Cutting keyboarding for Telexes in half becomes important when you send several hundred pages a day, as McGhies' company does. Now, instead of typing the message on a form for approval, then retyping it on a teletype machine, the message is keyed into a terminal, printed out, and approved. It is then transmitted to the message switch and passed on through the worldwide network.

"It's faster, saves an enormous amount of keying time, and we have a 'copy' of the message in memory," McGhie says.

By far the biggest advantage of Four-Phase's system, according to McGhie, rests in its multi-mode communications capabilities—Hasp, SNA/SDLC, asynch, and bisynch. "This allows us to just tie into the contractor's Univac in San Francisco, Boeing's system in Virginia, McAuto's in St. Louis, and our own in Houston and Saudi Arabia."

When to start

Though many organizations are postponing automation of their offices because of the recession, questions about the survivability of vendors, or potential resistance from staff, there are strong motivations to start now. One of the most powerful is that some of your competitors may now be implementing plans that will not only cut office overhead but also make them much more responsive to customers. □



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CIRCLE 71

TEAM UP FOR MAINTENANCE

by David Roman, Staff Writer

Vendors and users are united in their alarm over rising field-service costs, which consume more and more of the MIS/dp manager's budget each year. Maintenance costs have never been negligible, but a report by International Data Corp. (Framingham, MA) states that they could swell from the average 35 percent to 50 percent of the cost of ownership during the life cycle of a piece of equipment. To ward off that progression, vendors and users are joining forces to solve service problems, altering traditional methods of maintenance, and dissolving the traditional fence that separates both camps.

According to the IDC report, entitled "Maintenance Technology Trends/System Products," "Support is the most expensive after-sale item for a manufacturer." So there is pressure from management within and from customers without to minimize those costs.

IDC interviewed senior executives from 20 computer, terminal, datacommunications, and test-equipment vendors, and discovered that most of those companies are experimenting with new service techniques. "But executives were guarded in their comments," the report says, "reflecting a recognition that a company's service strategies have now become a critical component of overall corporate marketing strategy."

Digital Equipment Corp. led the way by inviting user participation in service, according to an assessment of DEC's field service, published in a 1981 issue of *Monosson on DEC*, a Boston-based newsletter. DEC field service is the envy of the minicomputer industry, says Monosson, operating efficiently and profitably in a way that other vendors believe defies efficiency and profitability.

Illustration by Harold Brooks

But DEC and other companies providing successful service insist they are not spending disproportionate amounts to achieve their ends. In fact, they spend less than other companies.

It's a matter of planning. Any company with a modest amount of foresight designs its products with reliability and serviceability in mind. These cost little if they have been considered from the start. Companies who are lazy about building these qualities into their products, or who add them on at the end of the design process just because competitors have already incorporated them, end up spending more as a result. This, in turn, contributes to high service costs.

Another problem is the shortage of trained service personnel. As hardware becomes more complex (and less expensive, which makes service

(Continued from page 160)

costs proportionately higher), knowledgeable maintenance workers become harder to find and more expensive to keep. Their scarcity makes vendors hesitant about sending them out on routine service calls. Consequently, workers with minimum experience and expertise are designated field engineers at many companies. At DEC, according to Monosson, "Young people with virtually *any* technical experience are potential field-service reps."

Manufacturers can't be blamed for not sending their big guns into the field. They'd rather keep them closer to home in case of a crisis. And there's another reason for keeping them at home base. Almost half of a service rep's time is spent traveling to and from call sites, and the time of a seasoned systems expert is too valuable to be spent in that manner. But lower-level service workers are in short supply, as well. DEC has been known to turn away customers in Third World nations just because it is unable to supply sufficient support.

Who cares?

One final problem has contributed to the uncontrolled surge in service costs—users don't care. "The historical predominance of computer leasing versus purchase produced a set of attitudes," reports IDC, whereby "users took little interest in the maintenance of equipment because they perceived of it as belonging to someone else." Vendors are fighting that attitude, and with apparent success. Slowly, over the years, users have become more involved with maintenance. Now it is not unusual to find users asking for more active roles in servicing equipment.

The evolution of service techniques has gotten customers used to the idea that they must participate in servicing equipment. They still do not split responsibilities with the vendors 50-50, but they are helping to shoulder the burden.

This recently acquired concern about service has fostered cooperation between users and vendors, but previously, the vendors were on their own trying to perfect cost-effective service. A popular solution was board swapping, a technique still used by many companies.

Board swapping is a simple procedure, and therein lies the origin of its limitations. If a system goes down, a field engineer visits the site and continues popping new circuit boards from his traveling inventory into the system until it is up and running once again. The displaced boards are taken to a repair center, where they

(Continued on page 164)

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CIRCLE 83

Maintenance

(Continued from page 163)

are tested for defects and repaired if necessary. On average, 30 to 50 percent of the replaced boards are in perfect condition. Some computer manufacturers estimate that as much as 5 percent of their assets are tied up in good boards waiting to be tested.

A new twist has recently been added to this method: Customers are allowed to swap the defective boards themselves. That would seem to increase the number of replacement boards that must be made available, but the opposite is true. Also, the swapping technique's limitations have been overcome. The method now eliminates the expense of a service call and the hit-or-miss element, as well. In-the-field board testers are used to identify the defective piece. This allows the good boards to remain in place and shrinks inventory of spare boards by anywhere from two-to-one to six-to-one.

Although board swapping would seem a small, logical step, it has taken awhile to indoctrinate the user into participatory maintenance. Therefore, swapping by the user is a relatively recent innovation. The user's hesitation was originally matched by the vendor's reluctance to let the customer "tamper" with the goods. Some vendors feared legal repercussions if a user was shocked or hurt trying to repair a system, and there was always the chance he would do more harm than good.

Reaching out

Regional repair centers represent the first physical and symbolic extension of service beyond a manufacturer's single service location, out to the user's territory. Their main advantage was proximity to the customer, which cut down travel time. While most service depots, as they are called, serve regional areas, many have specialties, and specific types of repairs are done. The regional and specialized focuses of the depots contribute to speedier servicing of equipment.

Xerox Corp. believes strongly in the value of service centers. It expects to quadruple its number of depots to 80 by the end of this year. In a deft move that will popularize the centers and encourage the participation of customers, Xerox is offering three service options. The most expensive is on-site service. If the user elects to have someone from the depot come pick up the equipment, which is another option, Xerox estimates that service costs will almost half. The user's best choice, though, is to drop off the equipment itself. Volunteer

Evaluations of system suppliers

Software reliability	Software price	Service maintenance quality	Service support quality	CPU reliability	CPU price
Microdata Basic Four DEC IBM	Microdata Tandem Texas Inst.	IBM Basic Four Microdata	IBM Basic Four Microdata Four-Phase	Tandem IBM DEC	Texas Inst. Wang Prime Basic Four
Wang Hewlett-Packard Tandem Four-Phase Prime Data General	MDS-Qantel Wang Gen.'l Automation Gould SEL Datapoint	DEC Hewlett-Packard Four-Phase Gould SEL MDS-Qantel	Hewlett-Packard DEC Prime Gould SEL Tandem	Microdata Hewlett-Packard Basic Four Four-Phase Prime Perkin-Elmer	Microdata Four-Phase DEC Datapoint Data General
Sperry Univac Burroughs NCR Texas Inst. Honeywell Datapoint MDS-Qantel Gen.'l Automation	Basic Four Prime Data General DEC Hewlett-Packard Four-Phase Burroughs NCR IBM Perkin-Elmer Sperry Univac	NCR Sperry Univac Data General Tandem Honeywell Wang Burroughs Prime Texas Inst. Perkin-Elmer	Honeywell Sperry Univac MDS-Qantel Wang Data General Burroughs Texas Inst. NCR	Texas Inst. Wang Data General MDS-Qantel Gen.'l Automation Datapoint NCR Sperry Univac Honeywell	Perkin-Elmer Hewlett-Packard Burroughs Gen.'l Automation MDS-Qantel NCR Gould SEL Honeywell IBM

IDC's new report on maintenance includes an interesting chart on user satisfaction with the systems provided by many leading vendors. The chart is based on a survey, conducted in early 1981, of only 560 users (264 responses were usable). But it reveals user attitudes that, for the most part, probably remain unchanged. IDC was unable to provide breakdowns on how many users rated each vendor on each factor. However, it conceded that more users rated vendors with large installed customer bases, such as IBM and Digital Equipment Corp. For each factor, users were asked to rate vendors on a scale of 0 (poor) to 5 (excellent). The lowest-rated three or four vendors, plus all ratings below 2.5, were excluded from this chart. IDC reports that there were very few ratings below 2.5, and that those surveyed generally exhibit a positive attitude toward their vendors.

carry-in/carry-out service reduces the number of expensive on-site calls for the vendor, who, in turn, can pass the savings on to all customers.

The most expensive on-site calls are, ironically, the least expensive—time and travel are even more wasteful when devoted to servicing inexpensive, low-end products. Although Xerox offers a sensible alternative, other, perhaps smaller companies are not sure how they will handle the problem of servicing peripherals. "One possibility that has to be considered," IDC reports, "is that as prices of peripheral devices and key components continue to decline, we could reach the stage where it is cheaper to throw the product away than have it repaired."

There is one method of service that cuts out travel altogether: diagnostics. Simple diagnostics check a system to make sure all features are functioning up to par. More sophisticated built-in diagnostics will alert the user to a system failure, and pinpoint the faulty component. They will also record all errors, so users can detect patterns should they develop.

Remote diagnostics rely on vendor-user collaboration. When a problem crops up, the user dials up a diagnostics center, and experts there run tests on the system. They can access, review, and repair programs, blocks of software, or entire operating systems. Remote diagnostics grew out of vendor "hot line" services, which users called for guidance when a piece of equipment failed. Sometimes the person at the hot line would talk the caller through the problem, dictating the steps for repairing a system. This method is still employed by some vendors, but remote diagnostics are usually preferred because they eliminate the middle person.

Peripheral reliability	Peripheral price
IBM Basic Four DEC Hewlett-Packard	Wang Basic Four Microdata Texas Inst.
Microdata MDS-Qantel Prime NCR Texas Inst.	Four-Phase MDS-Qantel Prime DEC Data General
Modcomp Data General Gen.'l Automation Perkin-Elmer Wang Honeywell Sperry Univac Burroughs	Gould SEL Tandem Datapoint Perkin-Elmer Hewlett-Packard Burroughs NCR IBM Modcomp

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Most hot lines have matured at least to the point where they are no longer staffed by trained technicians because as with traveling field engineers, the technician's time was wasted on minor tasks. A hot line is now more likely to be answered by a coordinator who routes the call to an appropriate specialist.

Maximizing productivity

Vendors have worked hard to compensate for a shortage of maintenance specialists. They have solicited the support of customers, and have developed equipment and service methods that maximize the talents of service workers. Portable maintenance devices are included in these developments.

IBM, Hewlett-Packard, and John Fluke Manufacturing each use portable maintenance units, which are microprocessor-based, feature their own keyboards and displays, and hook into products via several interfaces to uncover a problem. These devices describe the repair procedure, whether it be a simple mechanical adjustment, or a sequence of programming instructions. The IBM Maintenance Device, in particular,

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(Continued from page 165)

does not even have to be at the problem system site. Troubles can be diagnosed and remedies prescribed remotely. The device is not limited to use with one system either, so a worker who is familiar with it can service a number of IBM systems. IBM is pleased with the success of its device, whose rapid problem-solving abilities have reduced repair time from 10 to 29 percent.

Product maintainability is such a big concern that product designers work on a new product with serviceability in mind from the very start. At DEC, a 400-person engineering center works two to three years ahead of a product's release just to develop maintenance and reliability features. During this time, diagnostic "hooks" are easily built into the hardware and software. There's also a monetary benefit in monitoring the construction of a system step by step instead of waiting until it is completed. Listen to one executive's tale of financial snowballing, as told to IDC:

"It costs about 50 cents to identify a faulty integrated circuit at the time of incoming inspection. If a fault is discovered after assembling the circuit onto a printed circuit board, it costs about $5 to replace the faulty chip. If the board is assembled into a product and the fault is not found until final product tests, it probably costs about $50 to find and repair the faulty integrated circuit. If the product gets to a customer site and a service call is needed, the total cost of sending a service rep out there, diagnosing the failure to the board level, replacing the board, confirming that the system now works, and sending the board to a depot or factory for repair costs in the range of $500.

> These days, it is not unusual to find users asking for more active roles in servicing their equipment.

No matter how much service responsibility users take on, the burden will still fall most heavily on the manufacturer, as the executive's explanation shows. Although less expensive service is in the better interest of both parties, the vendor must go further to educate the user, and he must come up with the ideas on how to cut costs. The biggest deterrent to problems is a reliable product that increases user confidence and decreases the need for maintenance services. □

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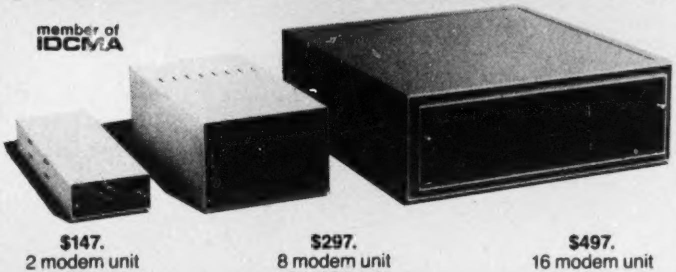

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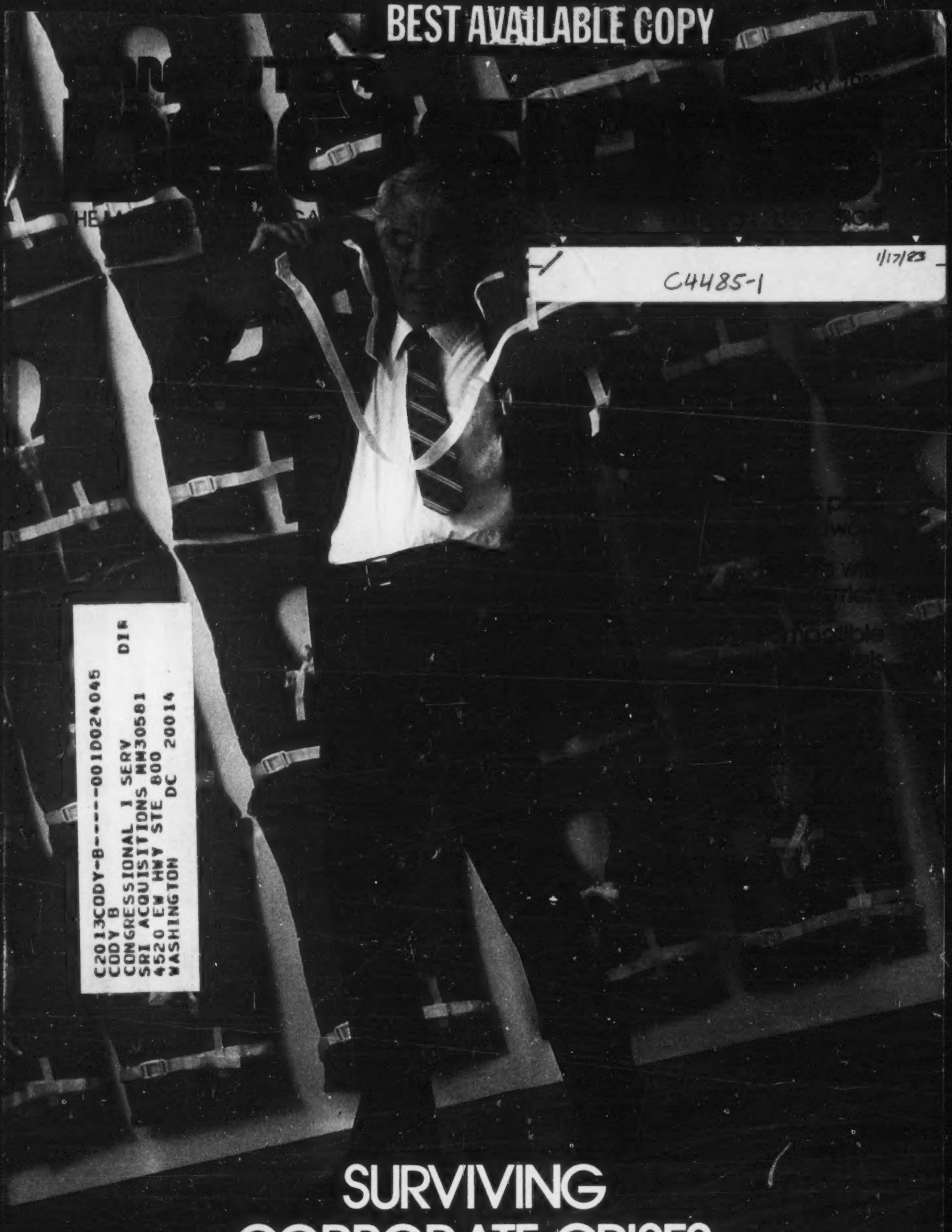

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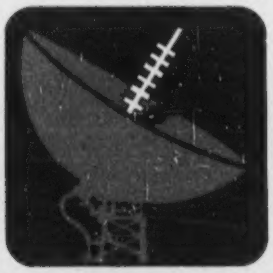

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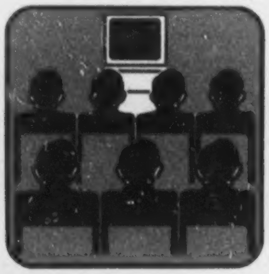

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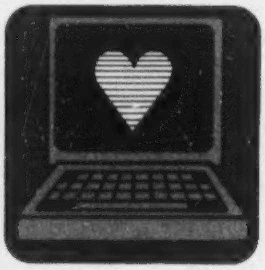

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COVER PHOTO: Stan Fellerman

by Lawrence M. Honig

FOLLOWING THE LEADERS

No recession for Top 30

What recession? The 30 largest dp vendors experienced slower—but still significant—growth during the first half of 1982 than in 1981. In contrast, the gross national product, according to the Department of Commerce, slid 2 percent (after accounting for inflation) during the same period.

Based on the historical relationship between the Top 30 firms' dp revenues and the revenues of the Top 100 list compiled annually by the Gartner Group (*Computer Decisions*, June 1982), we can project that the 1982 Top 100 will enjoy aggregate dp revenues of almost $75 billion, an in-

The fast-trackers

The fastest-growing vendors in data processing among the Top 30 for 1981, based on a comparison of first-half 1981 and first-half 1982 results. (All dollars in millions.)

	Company	Dp revenues 1st half '82	Dp revenues 1st half '81	Percent change '82/'81	Relative rank 1st half '81	Top 100 rank '81
1	Apple Computer	$ 273.7	$169.5	61.5%	25	23
2	Tandy (Radio Shack)	325.6	204.8	59.0	21	20
3	Storage Technology	516.6	384.6	34.3	12	10
4	Wang Laboratories	648.5	498.2	30.2	9	9
5	Hewlett-Packard	1,063.7	837.4	27.0	8	7
6	Prime Computer	208.3	172.6	20.7	24	24
7	Automatic Data Processing	351.8	296.0	18.9	18	18
8	DEC	2,075.6	1,781.4	16.5	2	2
9	Tektronix	186.8	162.6	14.9	28	30
10	IBM	13,229.0	11,553.0	14.5	1	1
11	Mohawk Data Sciences	180.3	159.5	13.0	29	28
12	General Electric	392.3	352.0	11.4	14	14
13	Data General	370.6	336.3	10.2	15	13
14	Electronic Data Systems	260.0	237.3	9.6	20	19
15	Harris	170.0	156.3	8.8	30	29
16	MAI	176.2	163.1	8.0	27	25
17	Motorola	210.0	194.5	8.0	23	23
18	Texas Instruments	347.4	322.4	7.8	17	16
19	Amdahl	216.5	203.4	6.4	22	22
20	Computer Sciences	345.0	324.9	6.2	16	17
21	McDonnell Douglas	175.0	165.0	6.1	26	26
22	Control Data	1,565.3	1,485.0	5.4	3	3
23	Burroughs	1,762.1	1,357.4	3.0	5	4
24	Honeywell	878.0	855.1	2.7	7	8
25	NCR	1,350.1	1,317.3	2.5	6	5
26	TRW	450.0	440.2	2.2	11	12
27	Datapoint	240.2	238.0	.9	19	21
28	Xerox	452.6	462.0	−2.0	10	11
29	Sperry-Univac	1,425.2	1,461.0	−2.5	4	6
30	Memorex	Acquired	353.9	—	13	15

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FOLLOWING THE LEADERS

crease of almost 12 percent (see chart, "The Top 30").

As evidence of the slower growth, no vendor is likely to double its 1981 dp revenues during 1982. In 1981, two of the Top 30—Apple Computer and Tandy—more than doubled in revenue over the preceding year. For the first half of 1982, Apple and Tandy again led among the larger companies, with impressive year-on-year growth rates of 61.5 and 59 percent.

This Top 30 managed a real (adjusted for inflation) gain of only 5.3 percent. In nominal (unadjusted) terms, the Top 30 scored better than double the U.S. economy as a whole. Significantly, only two of the repeat performers (the 29 corporations that made the Top 30 lists for both 1981 and 1982) grew by the U.S. average or worse, a respectable record for industry leaders in any business in this ruinous economy. And six of the leaders achieved growth of 20 percent or better.

The Top 30 for the first half of 1982 includes just one company that ranked out of the 1981 Top 30 list.

(Continued on page 63)

The Top 30

The Top 30 vendors in data processing, based on 1981 revenues showing relative rankings for 1981 and 1982. (All dollars in millions.)

	Company	Dp revenues 1st half '82	Dp revenues 1st half '81	Percent change '82/'81	Relative rank 1st half '81	Top 100 rank '81
1	IBM	$ 13,229.0	$11,553.0	14.5%	1	1
2	DEC	2,075.6	1,781.4	16.5	2	2
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9	Wang Laboratories	648.5	498.2	30.2	9	9
10	Storage Technology	516.6	384.6	34.3	12	10
11	Xerox	452.6	462.0	−2.0	10	11
12	TRW	450.0	440.2	2.2	11	12
13	General Electric	392.3	352.0	11.4	14	14
14	Data General	370.6	336.3	10.2	15	13
15	Automatic Data Processing	351.8	296.0	18.9	18	18
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21	Datapoint	240.2	238.0	.9	19	21
22	Amdahl	216.5	203.4	6.4	22	22
23	Motorola**	210.0	194.5	8.0	23	23
24	Prime Computer	208.3	172.6	20.7	24	24
25	Tektronix	186.8	162.6	14.9	28	30
26	Mohawk Data Sciences	180.3	159.5	13.0	29	28
27	MAI	176.2	163.1	8.0	27	25
28	McDonnell Douglas	175.0	165.0	6.1	26	26
29	Harris	170.0	156.3	8.8	30	29
30	Memorex*	Acquired	353.9	—	13	15
	Totals	29,846.4	26,644.7	12.0 ***		

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*Burroughs' results for 1981 do not include Memorex revenues. Restated to include Memorex, Burroughs ranked third in the first half of 1981.

**Motorola figures are restated to include Four-Phase Systems. Without Four-Phase, Motorola had 1981 dp revenues of $180 million and ranked No. 47, just above Sanders Assoc.

***Actually the growth is higher, since the $26,644.7 represents the 30 firms' total, whereas the $29,846.4 represents 29. Counting the 30th entity (Triumph-Adler), the Top 30 grew 12.63 percent to an aggregate of $30,011.4 million.

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FOLLOWING THE LEADERS

(Continued from page 60)

Motorola—by virtue of its acquisition of No. 40 in the 1981 Top 100, Four-Phase Systems—is now ranked No. 23 in the Top 30. There has been a casualty among the Top 10, too; based on estimated dp revenues, Xerox has fallen one notch to 11th, displaced by Storage Technology. And Burroughs, whose revenues now include Memorex, has moved from fifth to third. (With 1981 results restated, though, Burroughs has not risen.)

Who is growing at the top? Strong sales of 308X systems and associated peripherals have paced the reorganized IBM, whose revenues are up an estimated 14.5 percent. However, in contrast to 1981's results, IBM's incremental gain was not greater this time around than the *total revenues* for No. 2, DEC. Unless IBM has a very strong fourth quarter this year, it will not repeat this awesome feat, as it has for the last three years. DEC itself shows a more mature growth rate, 16.5 percent, than it has in years past. The big gainers in this Top 30 are Hewlett-Packard (27 percent), Wang Labs (30.2 percent), and Storage Technology, which consolidates its claim to membership in the elite top 10 by growing a strong 34.3 percent. Conversely, not one of "the bunch" (Burroughs, CDC, Honeywell, NCR, and Sperry Univac) was able to add more than 5.4 percent (see "The fast-trackers").

The ultimate spinoff—American Bell—has customers beta-testing its Net 1000 service. But don't expect any cash flow until the middle of this year. The only part of the phone company that generates dp revenues remains wholly owned Teletype, which didn't make it into this half-year Top 30 list.

Finally, the revenue cutoff point for inclusion in the full-year 1982 Top 100 (to be published next June in *Computer Decisions*) should rise substantially from last year's level of $56.9 million as consolidations occur within the list and major new players position themselves in dp. ☐

Lawrence Honig is director—industry measurement for the Gartner Group Inc., 72 Cummings Point Rd., Stamford, CT 06904, (203) 964-0096. The professional services firm provides continuous tracking and analysis of the information industry to users of electronic information and information-processing equipment.

by John Kirk

OFFICE AUTOMATION

Winners and losers of 1988

Long-term survivability is a critical criterion for selecting your prime supplier of office-automation hardware. Because there is little or no compatibility between suppliers, you must choose a vendor who can meet your needs in the years to come.

To provide insights to this key issue, *Computer Decisions* surveyed 75 consultants and managers of office-automation projects regarding two categories of vendors: those who supply "Fortune 1300" organizations and those who supply smaller, single-site operations. Twenty-two brave souls responded. The results of the survey, with respect to large users, are presented here.

The experts were given a list of 34 well-known vendors, from Apple Computer to Xerox, and asked to check one of three ratings for each name. Focusing on five years from now, early 1988, the ratings were "sure survivor," "likely survivor," and "not likely." In tallying results, the following weights were assigned for each vote: 10 for "sure survivor," six for "likely survivor," and two for "not likely." Total scores, and those for "sure survivor," are presented in the accompanying chart.

"Survivor" survey results

	Total score	Sure survivor score
Anderson Jacobson	52	1
Apple	104	5
AT&T	178	16
Burroughs	98	0
CPT	78	0
Data General	74	0
Datapoint	82	0
DEC	172	14
A.B. Dick	48	1
Dictaphone	66	1
Exxon	44	0
H-P	134	8
Honeywell	106	2
IBM	206	20
Lanier	90	2
Motorola (Four Phase)	74	1
NBI	92	1
NEC	70	0
Nixdorf	46	0
Northern Telecom	102	5
Olivetti	72	1
Philips (Micom)	78	0
Prime	80	2
Raytheon (Lexitron)	66	0
Rolm	98	4
Royal	46	0
Sony	70	1
Sperry	84	0
Syntrex	48	0
Tandem	80	0
Tandy (Radio Shack)	70	3
Wang	194	17
Wordplex	38	0
Xerox	164	11

Questionnaires to 75 consultants and large users of office-automation equipment show whom those experts believe will be serving the "Fortune 1300" corporations in five years.

The highest possible rating any vendor could receive was 220, if each respondent considered that vendor a "sure survivor." But no vendor received that score, because not all respondents rated every vendor.

As the survey questionnaires were studied, some vendors came up obvious winners, chosen almost universally, and others definite losers.

Exxon—the richest "kid" on the block—came up a loser. Nineteen respondents overwhelmingly rated Exxon Corp. as "not likely."

To nobody's surprise, IBM came out as the absolute, positive, hope-to-die winner. Twenty respondents proclaimed IBM a "sure survivor."

Wang also showed up as a lead-pipe cinch for the next five years. It received 17 "sure survivor" and four "likely survivor" votes. And in the minds of most, the phone company is here for the long haul, too. AT&T got 16 "sure survivor" votes and three "likely survivor."

DEC, taking fourth place in the survey, was neither overwhelmingly favored nor unfavored. Fourteen respondents classified Digital as a "sure survivor," five as a "likely survivor," and one as "not likely."

Respondents left Xerox with a widely differing accumulation of votes. The result, a mildly optimistic overall rating, was a real surprise for such a highly-respected name in the industry. Eleven respondents considered Xerox a "sure survivor." This total stands in sharp contrast to the 14 votes for DEC. Eight respondents said the company would be a "likely survivor," and three that the company was "not likely" to succeed.

The results on Hewlett-Packard were also curious. Just as many thought it was a "sure survivor"—eight of them—as thought it was a "likely survivor." Another three thought H-P was "not likely."

Apple Computer, in seventh place, garnered a fairly even sprinkling of votes. Five respondents put Apple in the top category, seven in the "likely," and six in the "not likely."

Securities analysts often research OA vendors, just as *Computer Decisions* has. In fact, Sanford Garrett, market research analyst for Paine Webber Mitchell Hutchins, research division of the New York-based stock-brokerage firm, did some long-term survivability research last fall. He presented his findings to members of the New York chapter of the International/Information Word Processing Association.

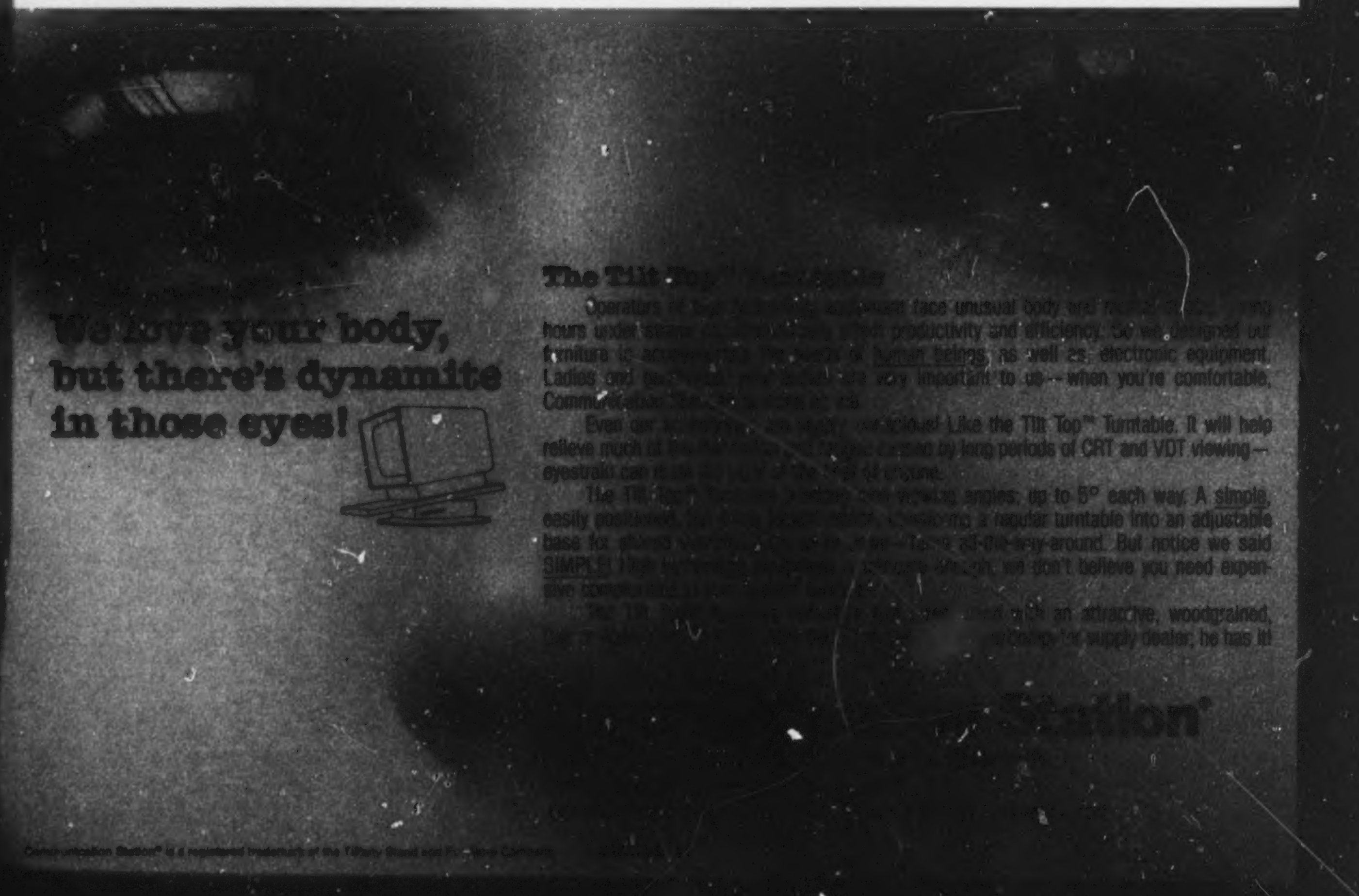
> "I see definite product problems that may come back to haunt CPT and Lanier in the future."
>
> *Garrett, Paine Webber*

Garrett noted for his audience that Wang, NBI, CPT, and Lanier have been remarkably successful to date. "But," he added quickly, "I see definite product problems that may haunt CPT and Lanier in the future." Garrett also said that IBM and Xerox "have been extraordinarily successful in grabbing a large share of the office-automation market."

Garrett then singled out the sure-fire winners—companies that would be around for the long haul. Predictably, these were IBM, Wang, Xerox, and AT&T. Garrett listed DEC and NBI as "pretty certain" to be around, and Lanier, CPT, and Datapoint as "hopefuls."

If you are with a smaller, single-site company, your concerns undoubtedly are focused elsewhere. So next month, we'll detail the experts' opinions of vendors that might be servicing your corporation five years from now. ☐

John Kirk, a contributing editor of Computer Decisions, *also researches and writes* Inside Word Processing, *a monthly newsletter published by Buyers Laboratory, Hackensack, NJ.*



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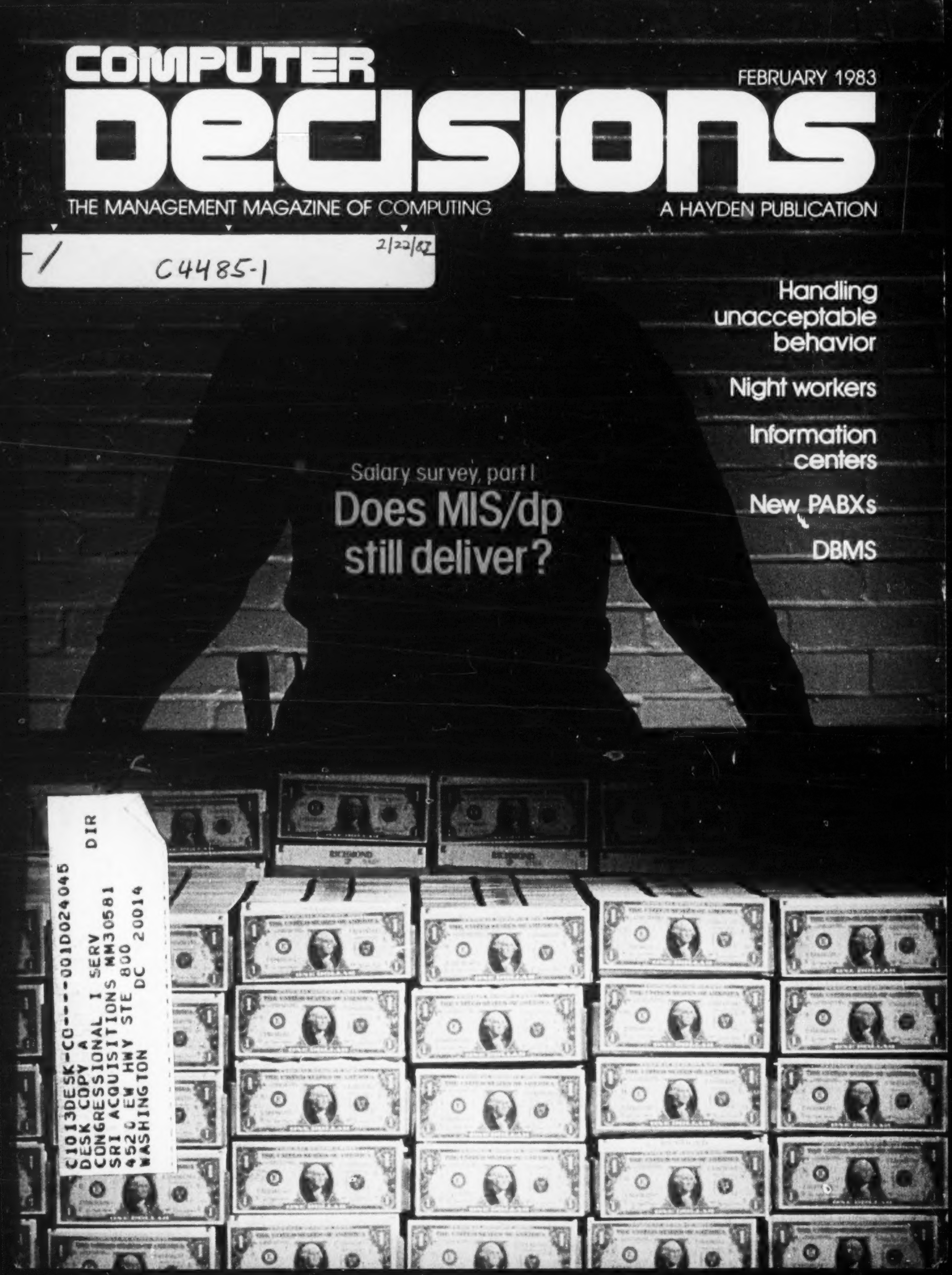

Handling unacceptable behavior

Night workers

Information centers

New PABXs

DBMS

Salary survey, part I

Does MIS/dp still deliver?

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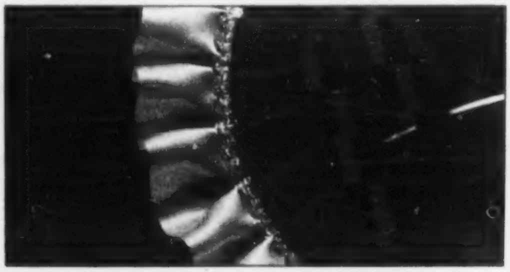

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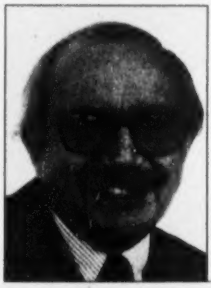

by John Kirk

OFFICE AUTOMATION

Winners and losers of 1988—Part II

Late last year, *Computer Decisions* surveyed 75 managers of office-automation projects and consultants on the long-term survivability of two categories of vendors: those that supply "Fortune 1300" companies and those that supply the smaller companies. The experts were mailed a list of 34 major vendors—from Apple Computer to Xerox Corp.—and were asked to check one of three ratings for each. The ratings were "sure survivor," "likely survivor," and "not likely."

Twenty-two experts responded. When their survey questionnaires were received, we assigned the following weights for each vote: 10 for "sure survivor," six for "likely," and two for "not likely." The results, for suppliers of both large, and not-so-large companies, appear in the accompanying chart.

Last month, we reported that the major vendors—IBM, Wang, AT&T, Digital Equipment Corp. (DEC), and Xerox (in that order)—were rated "most likely" to

(Continued on page 62)

"Survivor" survey results

	Single-site companies		Fortune 1300 corporations	
	Total score	Sure survivor score	Total score	Sure survivor score
Anderson Jacobson	54	1	52	1
Apple	162	10	104	5
AT&T	128	10	178	16
Burroughs	70	1	98	0
CPT	124	6	78	0
Data General	70	0	74	0
Datapoint	76	1	82	0
DEC	152	12	172	14
A.B. Dick	78	1	48	1
Dictaphone	112	2	66	1
Exxon	48	0	44	0
HP	116	7	134	8
Honeywell	84	2	106	2
IBM	178	17	206	20
Lanier	148	9	90	2
Motorola (Four Phase)	74	0	74	1
NBI	132	5	92	1
NEC	92	1	70	0
Nixdorf	60	0	46	0
Northern Telecom	74	2	102	5
Olivetti	92	2	72	1
Philips (Micom)	90	1	78	0
Prime Computer	88	0	80	2
Raytheon (Lexitron)	78	1	66	0
Rolm	62	1	98	4
Royal	80	0	46	0
Sony	94	2	70	1
Sperry	58	1	84	0
Syntrex	74	0	48	0
Tandem	94	1	80	0
Tandy (Radio Shack)	160	10	70	3
Wang	172	16	194	17
Wordplex	26	0	38	0
Xerox	136	8	164	11

Last month, we published first-half results of the "survivor" survey, which showed prime suppliers of Fortune 1300 companies five years from now. That list is repeated above. The results of the second portion of the survey—which vendors will be serving the smaller companies in January 1988—appear this month alongside the Fortune 1300 list.

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OFFICE AUTOMATION

(Continued from page 58)

survive. Surely the vendors named surprised no one.

But when studying the results of the second part of our survey, it's a new ball game. The survivor list of those supplying smaller, single-site businesses is a surprisingly different line-up. Here, along with their total scores, are the names of the top 10: IBM (178); Wang (172); Apple (162); Tandy (Radio Shack) (160); DEC (152); Lanier (148); Xerox (136); NBI (132); AT&T (128); CPT (124).

"It's not surprising that Tandy is high on the list," says consultant Thomas Wilds of New York. "Tandy is in competition with stores selling to people who walk out with their machine purchases under their arms."

Wilds stresses that the corner-store approach appeals to small companies. The small businessman can walk into a place selling Apples or TRS-80s and make a decision to buy but, "You won't get a purchasing agent from a Fortune 1300 company walking into the corner store."

Wilds' reaction to AT&T's inclusion on the single-site list is surprise. "I don't understand AT&T," says Wilds. "The individuals who gave AT&T high points in the survey must know something I don't."

Sanford Garrett, market research analyst for Paine Webber Mitchell Hutchins, holds a contrasting opinion. "The phone company," he says, "is going to have so large a presence that it must focus on *every* segment of the market, from the small user to the large one. It will be using the communications structure particularly," he adds, "to try to get into private homes. Just the way AT&T is selling telephones in stores now, it will be selling terminals."

Halsey Frost, of the Continental Group, Stamford, CT, believes that Lanier, NBI, and CPT don't have broad enough product lines to serve the Fortune 1300, but that they're most capable of serving single-site organizations. Garrett, however, thinks that CPT and Lanier will have been gobbled up by larger vendors by 1988.

Survey respondents, overall, see IBM and Wang as straddling the marketplace, with one foot in the Fortune 1300 and one in the single-site companies. Frost agrees that IBM is in such a position. It offers products like Displaywriter and the Personal Computer for single-site organizations, as well as a full product line for larger companies. Frost questions the depth of Wang's penetration into the single-site market, but allows that Wang has aimed in that direction with the Wangwriter.

Garrett, on the other hand, has good reason to believe in Wang's strength in the single-site market. He's discovered that "Wang is starting to build a very extensive dealer network of its own." He says Wang is building it internally, using independent dealers rather than acquiring someone else's network, or going to Sears or a Computerland. According to Garrett, Wang is picking up locally-based dealers with one, two, or three locations. Those dealers will sell other products that are not competitive with Wang's line.

Garrett feels that Apple scored high on the single-site list only because many have heard of Lisa and MacIntosh (kinds of Apple computers) and assume they address a small-business market. He thinks that Apple lacks the necessary support capabilities and will not succeed.

Garrett explains his outlook on support: "The small businessman, in five years, won't be able to stand on his own two feet. He will need support. That's not to say he won't buy a personal computer. But," Garrett continues, "the equipment is going to get increasingly sophisticated. And that means that successful vendors will be those that can provide support in some fashion—through training classes, if nothing else—to executives of smaller organizations." ☐

John Kirk, a contributing editor of Computer Decisions, *also researches and writes* Inside Word Processing, *a monthly newsletter published by Buyers Laboratory, Hackensack, NJ.*

Salary survey, part I

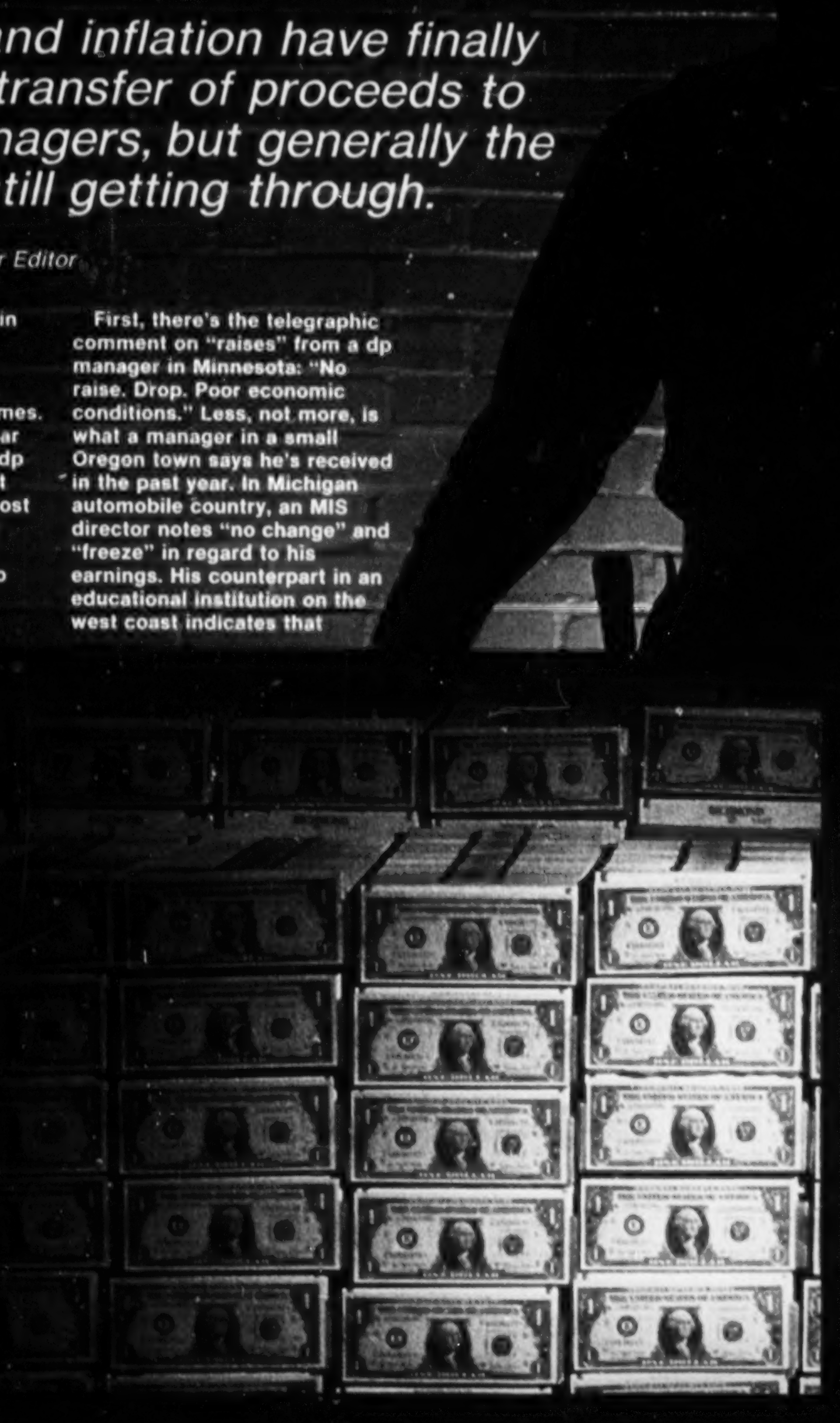
Does MIS/dp still deliver?

Recession and inflation have finally slowed the transfer of proceeds to MIS/dp managers, but generally the goods are still getting through.

by David Whieldon, Senior Editor

With the nation's economy in severe recession, it's not surprising to find many managers and executives complaining about tough times. But would you expect to hear such complaints from MIS/dp managers? Perhaps not, but some respondents in the most recent *Computer Decisions* Salary-Status Survey have provided disturbing clues to what's happening to their salaries.

First, there's the telegraphic comment on "raises" from a dp manager in Minnesota: "No raise. Drop. Poor economic conditions." Less, not more, is what a manager in a small Oregon town says he's received in the past year. In Michigan automobile country, an MIS director notes "no change" and "freeze" in regard to his earnings. His counterpart in an educational institution on the west coast indicates that



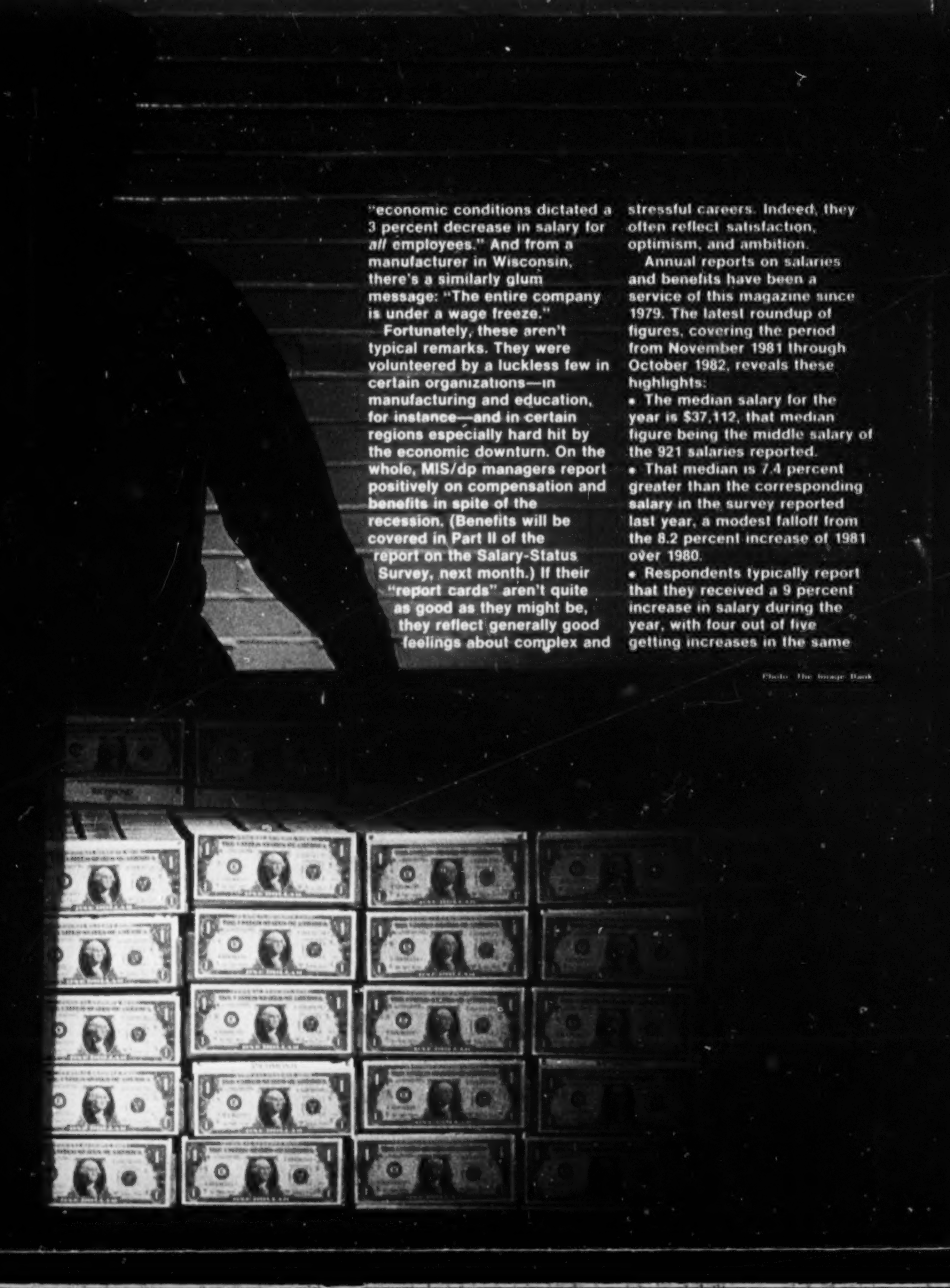


Photo: The Image Bank

"economic conditions dictated a 3 percent decrease in salary for *all* employees." And from a manufacturer in Wisconsin, there's a similarly glum message: "The entire company is under a wage freeze."

Fortunately, these aren't typical remarks. They were volunteered by a luckless few in certain organizations—in manufacturing and education, for instance—and in certain regions especially hard hit by the economic downturn. On the whole, MIS/dp managers report positively on compensation and benefits in spite of the recession. (Benefits will be covered in Part II of the report on the Salary-Status Survey, next month.) If their "report cards" aren't quite as good as they might be, they reflect generally good feelings about complex and stressful careers. Indeed, they often reflect satisfaction, optimism, and ambition.

Annual reports on salaries and benefits have been a service of this magazine since 1979. The latest roundup of figures, covering the period from November 1981 through October 1982, reveals these highlights:

- The median salary for the year is $37,112, that median figure being the middle salary of the 921 salaries reported.
- That median is 7.4 percent greater than the corresponding salary in the survey reported last year, a modest falloff from the 8.2 percent increase of 1981 over 1980.
- Respondents typically report that they received a 9 percent increase in salary during the year, with four out of five getting increases in the same

(Continued from page 117)

positions—i.e., without changing jobs.

- Salaries vary by kind of organization (best is manufacturing/processing, and worst is education, in four major categories) and by region of the country (best is Middle Atlantic—that is, New York, New Jersey, and Pennsylvania—and worst is South Atlantic—Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, and the District of Columbia).
- Managers replying to the survey believe, by a ratio of three to two, that their salaries aren't keeping up with inflation.
- Moving up into general management from MIS/dp management is a goal of 43 percent of respondents.
- An overwhelming majority—89 percent—would move to another organization if incentives were great enough: "great enough" meaning a pay increase of 20 percent or more for two out of three respondents, plus greater benefits.
- The median (middle) total MIS/dp budget for the covered organizations is $469,091. The mean (average), however, comes to slightly more than $2.5 million.
- On balance, MIS/dp managers in this year's survey are rather content with their jobs, rating them almost 4 on a scale of 1 through 5 (where 1 equals quite discontented, 5 equals quite content).

The figures and comments, too, speak for themselves, as the following paragraphs show. Indeed, they articulate conditions and concerns of managers better than ever before, because 928 *Computer Decisions* readers—more than in any earlier survey—returned questionnaires this year. (See the box, "How survey was conducted.")

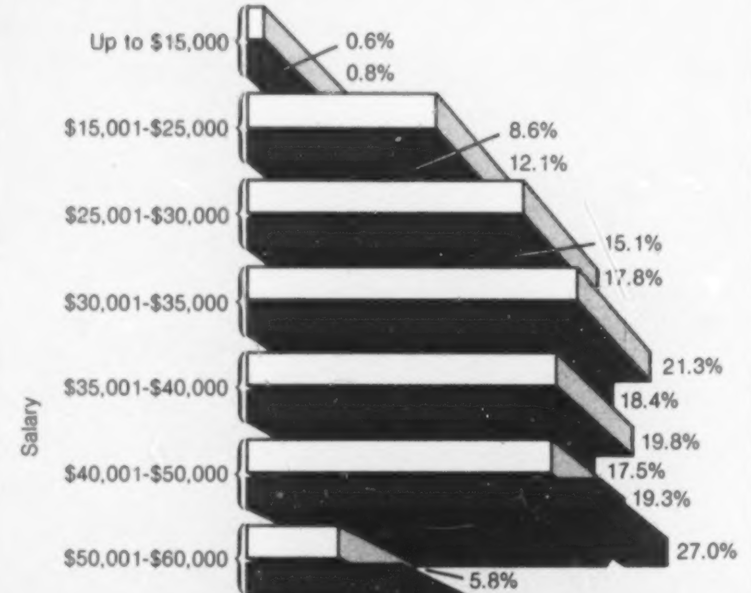
Behold the "middle manager"

No one wants to be considered an average performer. But when researchers conduct a survey like this one, it's very convenient to pick out a middle income as a reference point, even though half the readers may turn a bit green as the other half glow. For late 1981 through late 1982, then, the middle figure was $37,112. The bar chart in an accompanying illustration shows what percentages of respondents fall into the various salary categories. But here, in capsule form, are some insights into the results:

- Almost two-thirds of respondents (62.9 percent) earn between $30,001 and $50,000.
- Almost nine out of 10 answering get salaries of $25,001 to $60,000.
- Only six respondents answering the salary question report they earn $15,000 or less.
- Only 2.7 percent of those answering—25 individuals—enjoy incomes of $60,001 to $80,000.
- No one checked off the box indicating compensation of more than $100,000.

One characteristic that seems to mark big earners is ambition. In a limited sample of those respondents whose pay is between $60,001 and $80,000, all indicate that they'd be willing to move to another organ-

How much MIS/dp managers earned in 1981 and 1982



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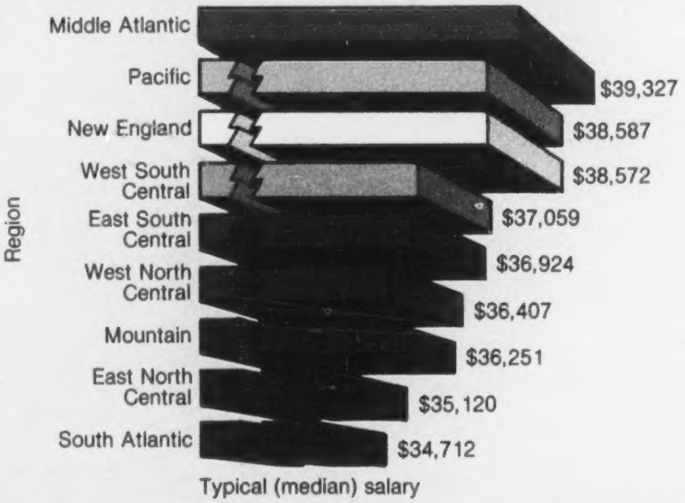
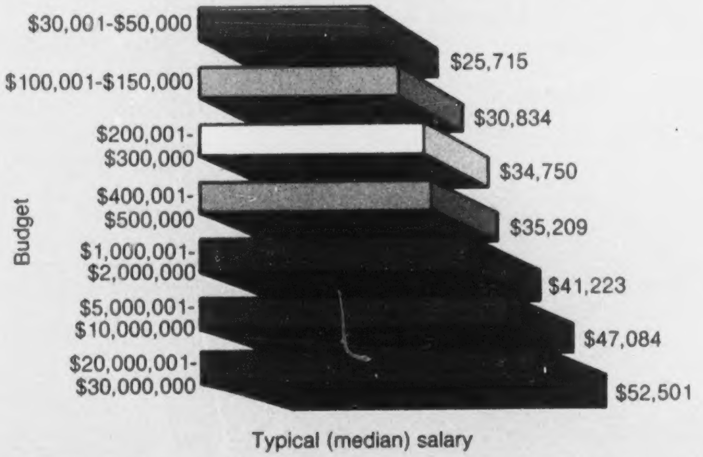
Salaries differ substantially from region to region . . .



Middle Atlantic: NY, NJ, PA
Pacific: AK, WA, OR, CA, HI
New England: ME, NH, VT, MA, RI, CT
West South Central: AR, LA, OK, TX
East South Central: KY, TN, AL, MS
West North Central: MN, IA, MO, ND, SD, NE, KS
Mountain: MT, ID, WY, CO, NM, AZ, UT, NV
East North Central: OH, IN, IL, MI, WI
South Atlantic: DE, MD, DC, VA, WV, NC, SC, GA, FL

. . . and salaries are higher where budgets are higher



Note: Only selected budget categories are shown. Median salary figures for other categories can be interpolated with reasonable accuracy.

ization if the incentives were great enough. All would require a pay boost of from 23 percent to more than 29 percent, they say, plus other benefits. Four of these seven respondents—all managers in charge of dp or MIS or both—are interested in getting into general management.

Five of the managers operate with budgets of $5,000,001 to $20 million, while one has responsibility for more than $40 million. Perhaps because their budgets and paychecks are high, these respondents seem content to stick to working for employers (whether present or future): Four of the seven have never considered setting up their own business, and none has made plans to go out on his or her own in the next three years.

What would life be like for you if you realized your ambitions to get into a top pay category? Some vision of that life comes from a dp manager who has done just that. He's earning more than $80,000 a year in an eastern publishing company, having received an 8 to 10 percent increase during the past year. Nonetheless, he feels that his compensation isn't keeping up with inflation, and he'd move for a boost of 23 to 25 percent.

But a new position in another organization would have to provide greater challenge and a chance to move into general management.

As for his present job, he presides over a budget of between $5 million and $10 million, more than 100 employees, 57 minicomputers, and 10 microcomputers. He's labored in dp for a quarter-century and enjoys many fringe benefits, including pension plan; cash bonuses; medical, dental, and life insurance; physical exams; education assistance; moving expenses; and a personal secretary.

How do dp dollars stack up?

It's heartening to know, despite the turbulence in the economy, that MIS/dp managers' salaries are holding up fairly well overall. The median salary in the most recent survey is $2,571 higher than the median in last year's survey. (The median salary is the one smack in the middle of all the

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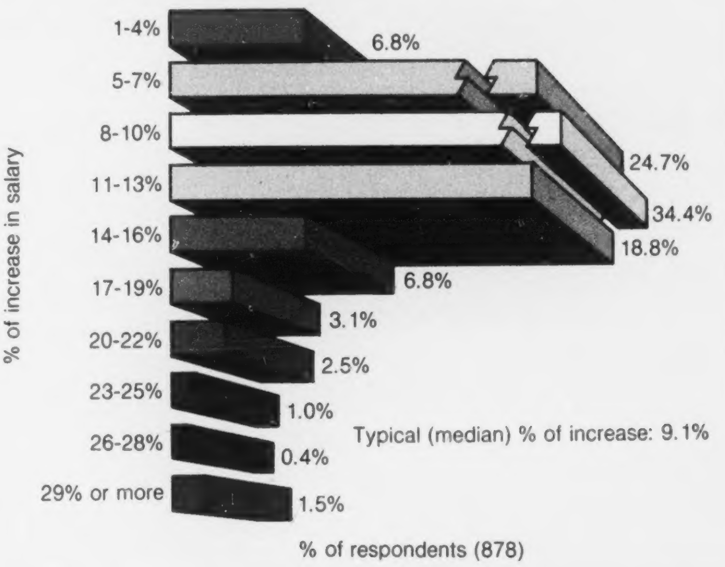
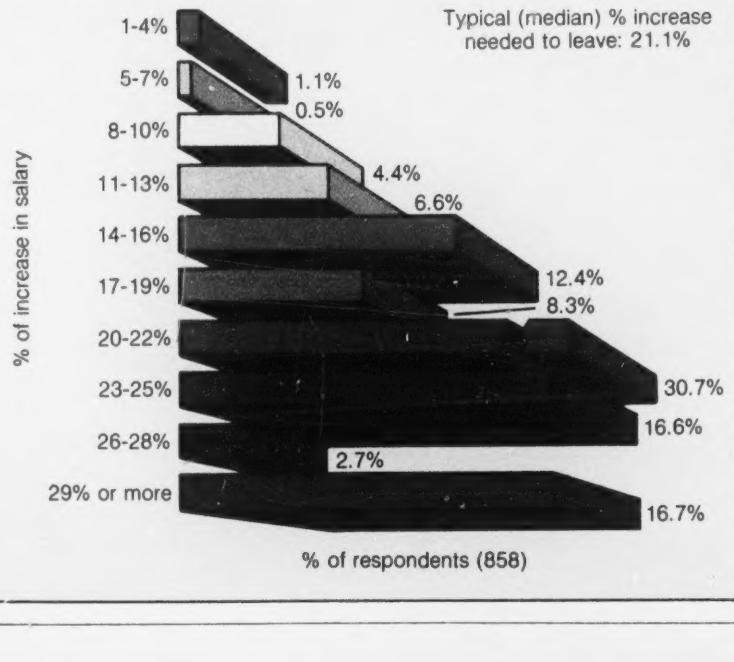
MIS/dp managers report the latest pay increases . . .



. . . and the increases they'd require to move elsewhere



salary figures collected in the survey.) Last year's median was $2,602 ahead of the one from the year before.

Another item on the questionnaire elicited managers' reaction to their pay. That question asked, "How does your situation as an MIS/dp manager compare with the situations of managers with comparable responsibilities in other departments?" One of the five answer categories listed was "salary." In responding, slightly more than half marked off "about the same." But taken altogether, the figures weight the answers a bit in the direction of "better" than others, rather than in the direction of "worse."

Broadly speaking, compensation might also be thought of as including certain benefits that contribute to personal wealth, sooner or later. For example, there are cash bonuses; they're enjoyed by 28.8 percent of the 928 respondents in this year's *Computer Decisions* survey. Furthermore, almost the same proportion (28.1 percent) have profit-sharing arrangements with their employers. About half as many (14.2 percent) are extended stock-purchase options. Finally, more than four out of five (81.3 percent) declare they can look forward to future compensation in the form of pension payments. (All these figures except profit-sharing are down slightly from last year's survey results, but that effect may be due to almost unavoidable biases in survey methods.)

Ups and downs

Despite the fact that a few respondents went out of their way to write in complaints about wage freezes and reductions, the great majority of managers replying indicate they got raises during the survey year. Indeed, 94.6 percent of the 928 respondents answered the salary-increase question, all of them positively because there were no zero-increase or salary-cut responses to check off. The typical, or median, raise was 9.1 percent. Futhermore,

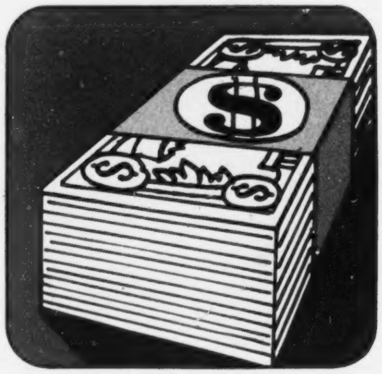
(Continued on page 126)

(Continued from page 122)

more than three out of four answering say they got pay boosts of between 5 and 13 percent over the year.

Nearly all the MIS/dp managers reporting got their increases in a familiar way, through raises in the same jobs they've been holding; that's true for four out of five (80.6 percent). A few are earning more now because they were promoted (7.8 percent). And a few others (6 percent) moved to other organizations for more pay during the year.

A man in charge of MIS for a steel-fabrication company in Missouri reports that employees companywide took a 10 percent pay cut. At about the same time apparently, he received a cost-of-living increase of 8 to 10 percent, so the net effect was to leave him about where he was. Nonetheless, he's quite content with his job, which pays between $30,001 and $35,000, and he says he'd require an increase of 29 percent or more to make a move.



In the east, a manager who is second in command in the dp shop at an educational institution got an increase of between 5 and 7 percent within the last year. He got it, he wearily explains, because he "lived long enough."

One human-resources executive in the banking industry confesses that the size of increases has been cut back for dp personnel and others under his jurisdiction. "Under our guidelines," the merit increase for a top performer might have been 12 percent in 1982," he explains. "But in 1983 that increase will be about 9 percent. An average performer, fully adequate, might have been given 8 or 9 percent last year, but now he can expect 5 to 6 percent." Those figures cover managers and lower-ranking personnel, he says, and many of the 8,000 employees he deals with are in systems, programming, and operations. "Anyone who's smart is reducing increases now," he concludes.

"I haven't seen a salary freeze or salary reduction in dp," says Anthony L. Drapelick, director of dp career management at Connecticut General Life Insurance Co., Hartford. "But there's certainly been retrenchment, or a rethinking of the past salary history of dp, where it was always 'more and more.' Over the past few years salaries were running 10 to 15 percent more annually. I don't think we'll see that anymore."

Drapelick believes that the recession is largely responsible for this change in attitude. "Company managements are keenly aware of expenses now," he observes. "When business is going well, managements are open-handed toward dp, and they can always cover dp expenses with profit. When things get tight, though, they look hard at the millions being spent. And they start making hard-nosed business decisions. Data processors and their salaries have been immune to the facts of life, but now the facts of life have caught up with them."

It's no revelation that salaries vary by kind of organization and by geographic region. According to survey results, MIS/dp managers do best in manufacturing or processing ($38,750 median), followed by wholesale or retail trade ($36,848); government, including the military ($36,600); and education ($32,283), in that order. You'll observe that the typical respondent in manufacturing/processing earns almost $6,500 more than the typical respondent in education. (Note: The returns for some categories were so small in proportion to the four mentioned that

How survey was conducted

Participation by readers of this magazine in the Salary-Status Survey was impressive: Very nearly 19 percent of the 4,908 MIS/dp managers contacted by mail filled out questionnaires, a substantial return. No special inducements were offered, and each recipient was asked to respond to 45 questions, some of them detailed, spread over four pages. The response, the editors believe, is a testimony to reader loyalty. Not only that, but the volume of answers makes the figures statistically valid and projectable.

More facts about the survey:

- The 120,000-name circulation list of *Computer Decisions* was culled to produce a list of MIS/dp managers, who constitute about 45 percent of the magazine's readership. Enough names from the MIS/dp managers list were random-selected by computer to make up a mailing of nearly 5,000 questionnaires.
- Under those conditions, every reader with a manager's title or its equivalent had about one chance in 11 of receiving a questionnaire.
- Not all respondents answered every question, naturally; that's why somewhat fewer than 928 replies may be reflected in the text and in bar charts.
- Managers returned questionnaires last fall, chiefly during the month of October, for processing by the research department of Hayden Publishing Co.

Finally, it's worth noting that many of the MIS/dp managers who participated in the survey answered open-ended questions and volunteered other comments about their work. Those answers and comments will help *Computer Decisions'* editors plan and develop additional articles.

(Continued from page 126)

they aren't valid or projectable.)

There's also a pattern in geographic location—and you might very well guess which managers in which areas earn most or least. Compare your guesses to what CD's readers reported: The lowest-paying region for MIS/dp managers is the region stretching from Virginia to Florida; there the typical (median) salary is $34,712. The medians look better proceeding upward through the list of heartland states to New England, No. 3, with a figure of $38,572. Second-ranking is the Pacific region, at $38,587. At the top of the heap is the Middle Atlantic region (New York, New Jersey, and Pennsylvania), where managers typically earn $39,327. (For details, see the accompanying bar chart.)

Though keeping up fairly well with the increased cost of living, managers in the survey don't necessarily perceive it that way. When asked, they replied, three to two, that their compensation *isn't* keeping up with inflation.

Despite the recessionary pall that's settled over the economy, a nationwide personnel firm has good news for workers in information processing. Competition for professionals "should cause '83 salaries to rise at least as rapidly as the projected '83 inflationary spiral," according to Fox-Morris Personnel Consultants, headquartered in Philadelphia. The company, which conducted a jobs-forecast survey, adds that "the overall demand for computer experts will rise 14 percent above '82 levels" in 1983. Even more specifically, Fox-Morris predicts that the demand for MIS directors will rise 7.9 percent in 1983.

Upward mobility for managers

Moving up or moving out to better one's compensation and working conditions is commonly on the minds of managers. Naturally, most wouldn't mind being promoted. But how many would be willing to leave MIS or dp behind to climb up into general management? As you may have guessed, that's a question easily answered from survey returns. Indeed it *was* a question answered by 904 of the respondents. A substantial minority—43 percent—say they'd be interested in moving out of MIS/dp into general management.

A woman who's not very happy with her job, at a West Virginia college, offers a possible explanation. Apparently her unhappiness stems in part from the administration's indifference to her department, where she's second in command. She's interested, she says, in moving out of MIS/dp management into general administration "to promote the needs of dp." She adds, "If you can't beat 'em, join 'em."

That theme of dissatisfaction with MIS/dp as a cog in organizational machinery appears rather regularly in the returned questionnaires. Many managers feel that they're not consulted when they could be helpful; that they're not privy to important decisions—even those that affect them; and that they're simply considered chiefs of support functions. One man, who earns more than $70,000 yearly at a Michigan manufacturer, yearns for "broader responsibilities." And he volunteers some further comments: "MIS is less than an optimal career. Often, you're out of the mainstream of the company. Dp plays no role in acquisitions or divestitures, yet is affected by such moves. Often dp people must shoulder the blame for other departments."

Others second this opinion when stating that they're interested in moving up. "There's only so far one can go in dp," says a dp department manager in San Diego, CA. A dp manager in Louisiana complains of "lack of acknowledgment for job performed." And a second-in-command in New York says, "Service-department role is not satisfying."

The reason given by a midwestern MIS director in his 50s for wanting to move from MIS management into general management is "20-plus years of stress." A somewhat younger dp manager on the west coast wants the same for a somewhat similar reason: "I'm tired of dp." But many of the comments are more conventional and reflect a desire for self-improvement and advancement. A Wisconsin

Want more pay? Produce more!

"Pay for performance has become the cornerstone of the compensation strategy of most companies," declares Peter Chingos, commenting on changes taking place among top executives of medium-sized industrial companies. "A decade marked by a weak economy and increasing international competition has changed the orientation of personnel policies from paternalism to productivity. The continuing issue is how best to design compensation programs that will effectively pay for performance."

Chingos, who is executive-compensation partner with the accounting firm of Peat, Marwick, Mitchell & Co., New York, speaks of chief executive officers, second executives, chief financial officers, and division presidents. (Their salaries for 1981 were studied.)

Although MIS/dp managers aren't compensated so well as those executives, there's bound to be a trickle-down effect in many organizations. That very likely applies to two other findings, as well: "Companies are moving away from discretionary incentive compensation plans to plans that clearly identify performance standards and pay for attaining them," says Chingos. "And companies are paying for achieving three- to five-year business objectives, as well as for making annual budgets."

Salary-Status Survey

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dp manager feels he has a good perspective of his company and can provide needed leadership. From Illinois, another such manager explains, "I'm not a technician, and I have more to offer." Another midwesterner in charge of dp seeks "authority commensurate with responsibility."

On the other hand, a Californian in a wholesale or retail trade organization says, "I really feel I'm part of general management now." That's understandable, perhaps, because he has a strong background in sales as well as in dp. In fact, his feeling of personal influence is great enough that he considers it a benefit or perquisite.

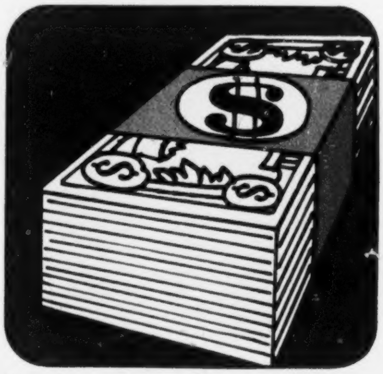
Finally, there's another minority report: "I believe that being the head of dp *is* general management," declares a young manager in Los Angeles. "I've been involved in everything—paper-flow analysis, dispatch analysis, sales analysis, marketing strategies, and merger possibilities."

Moving right along . . .

You may have a pretty good idea of how much more salary you'd require to move on to another organization. It might be useful to compare your figure—in percentage increase over your present salary—to those of managers who took part in our survey. The typical manager would require 21.4 percent (median figure) more salary to join another organization. Almost half the respondents claim they'd want 20 to 25 percent more, and at the top end of the scale, one in six would need 29 percent or more.

High on the list of incentives to move from present jobs is increase in pay, for four-fifths of the 928 respondents. Bonuses are of interest to nearly half, while two-fifths like the idea of profit-sharing. Improved retirement plans and stock-purchase options appeal to three out of 10.

"More management support" is what would induce a dp manager in a Texas nonprofit organization to make a move. She elaborates: "I wish my CEO would include dp in planning. There's so much we could do to help. Instead, we learn of big changes at the last moment."



Along the same lines, the survey questionnaire asked CD readers to reveal other plans for switching off from present jobs. For instance, one query, directed to managers who aren't the top bosses in their departments, dealt with going to an organization where they *would* be top banana. There was a very positive response, as two out of three of the 332 answering expressed a wish to be chiefs.

Furthermore, a few want to get out of their present organizations and create organizations of their own. At least, that's one interpretation of answers to a question asking if respondents have ever considered leaving their regular jobs and starting their own businesses, "consulting, selling computers, writing software, or the like." Seventy-three percent said yes.

But contemplating a step of this kind and doing something about it are quite different matters. That becomes clear when questionnaire recipients were asked a followup question: "Do you have definite plans to strike out on your own within the next three years?" Only one of eight answers was affirmative. Naturally, some of those who said no may muster the courage and marshal the resources to make this jump in 1986 or later.

One young dp manager on the west coast confides that he's encountered an interesting business opportunity just by staying put. "The owner of this company offered me a partnership in a timesharing-service venture. I'm considering it."

But, wait a minute, some respondents are *already* engaged in free enterprise, while holding down regular jobs. Three out of 10 of those answering a question on moonlighting report they're drawing two paychecks, with managers earning a median $2,667 for work away from work. Almost 40 percent of those with this kind of income earn up to $2,000 each annually, while one in six supplements a salary by more than $7,000. (For more on moonlighting, see the feature in the next issue of *Computer Decisions*.)

With demand high for trained personnel, all associated with dp have acquired a reputation for job-hopping in recent years. This magazine's past surveys have suggested that this reputation may be deserved, even for managers, to some extent. In the most recent survey, roughly one respondent in three has held three or more jobs in the past 10 years. Another one in three has held two jobs in that time. The remaining one-third of respondents have held but one job for the decade. (The exact percentages are 36.9, 31.6, and 31.5.)

Perhaps the youthful nature of MIS/dp and the youthful nature of its managers dictates that practitioners be peripatetic. According to survey figures, slightly more than half the respondents are in their 20s and 30s, and somewhat more than half have been in the field for 15 years or less.

If one of your counterparts at a professional meeting hints that he or she is making more money than you are—and has a bigger budget, too—you shouldn't be surprised. Larger budgets—and more responsibilities—generally go hand in hand with higher salaries. That's borne out by figures from the CD survey. For instance, respondents earning $15,001 to $25,000 report a total MIS/dp budget of $85,000 (median figure rounded to the nearest $100). Further up the line, those with incomes of $35,001 to $40,000 report a total budget of $590,000, while managers

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Salary-Status Survey

(Continued from page 130)

paid $60,001 to $70,000 report $8,125,000.

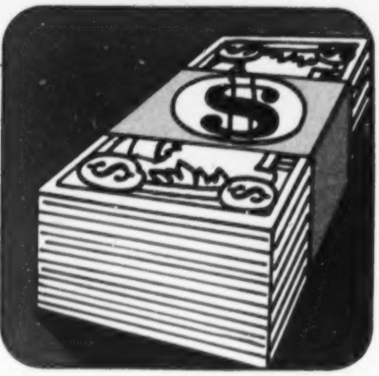
To give you some idea of what kind of budget money the typical respondent sees moving through his or her entire organization, consider the median from the survey; $469,091. Thus, half those answering see less than that amount, and half see more. The *mean* budget figure, however, is a bit more than $2.5 million, chiefly because there is a substantial number of managers in the high-budget brackets. In the $40 million-plus range, for instance, 24 managers sign in.

Here are some other perspectives on total MIS/dp budgets:

- One respondent in seven reports a total budget of up to $100,000.
- Two in five report budgets between $100,001 and $500,000.
- Another two in five say their organizations budget from $500,001 up to $10 million for MIS/dp.
- And one in 12 declares a total budget of more than $10 million.

In the last analysis, what do all the facts and reactions from the survey come down to? This magazine's snapshot of more than 900 MIS/dp managers in late 1982 shows men and women rather heavily stressed and subjected to the turmoil of a fast-changing specialty. Nonetheless, by their own accounts, they're fairly well compensated, when compared with other managers—despite the recession. And though a substantial minority is interested in moving up into general management and an overwhelming majority in moving out into another organization (given sufficient incentives), they rate themselves fairly content with present jobs.

Some of them, in fact, offer comments on their work and careers in MIS/dp that range from tired to inspired. From Texas' Big D, a manager writes, "There has to be an easier way to make a living, like retiring to



the coalmines of Colorado!" Or these words from western Pennsylvania: "Sometimes it's not as much fun as it used to be." And another manager offers: "You gotta love it or you'll hate it!"

But other declarations are more positive: "I've come a long way in a short time," says an Oklahoman in his 20s. Adds a New Yorker, "I've been very lucky in the opportunities given and the people I've worked with and learned from." ☐

Part II of the Salary-Status Survey report will appear in the March issue of Computer Decisions.

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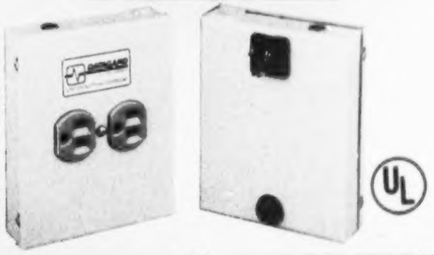

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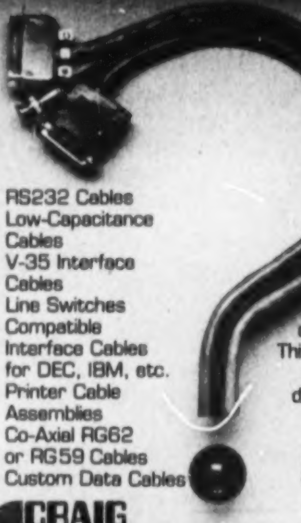

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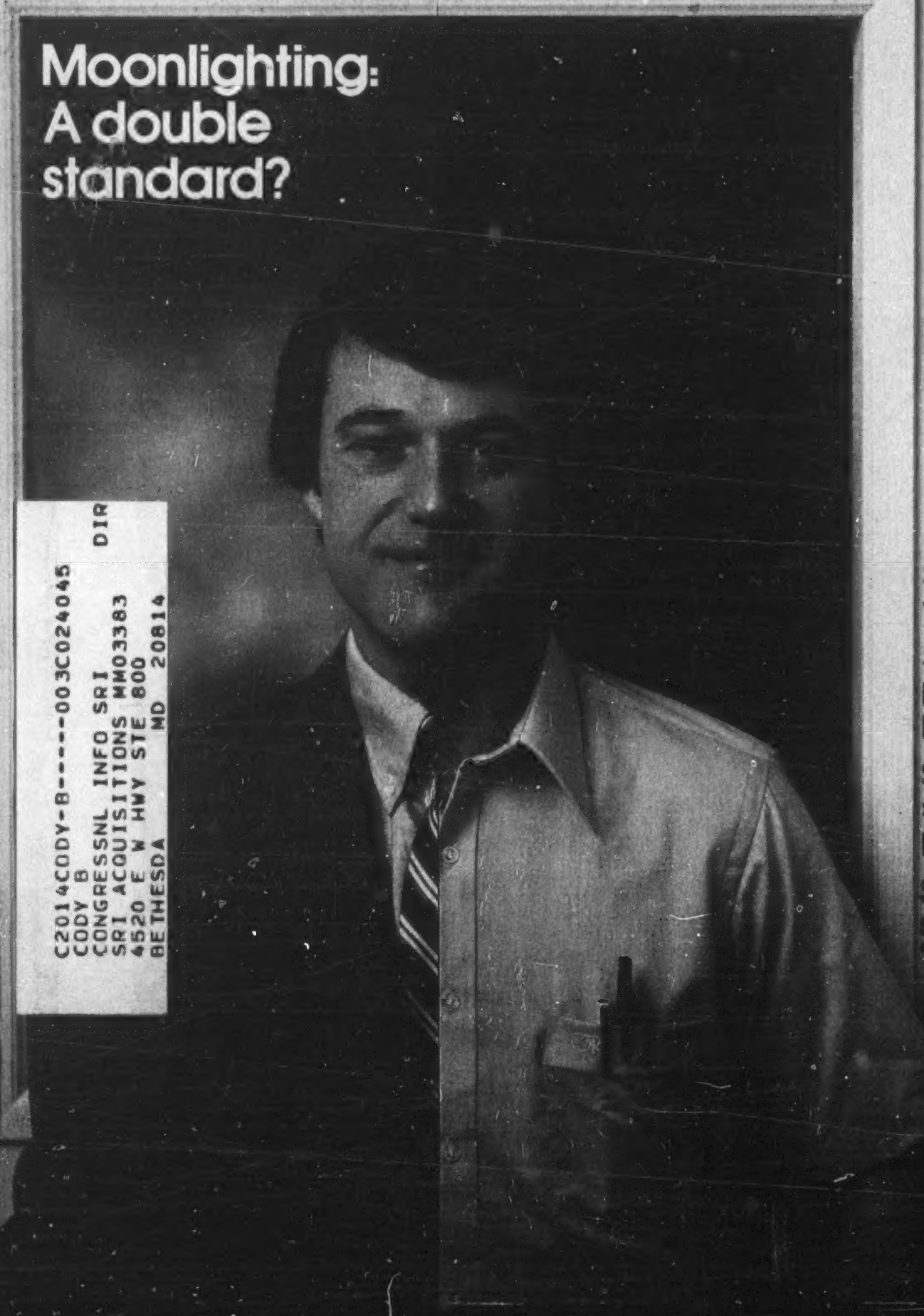

Moonlighting: A double standard?

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SNA: IBM wins again

Solving power problems

Salary-status survey, part II

Software successes '83

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COVER PHOTO: Bill Oliwa

Salary-status survey, part II

Cashing in on extras

The new frontier in MIS/dp benefits is executive-style extras, and the possibilities are endless. How do your benefits measure up?

by David Whieldon, Senior Editor

MIS/dp managers slowly are pushing into areas of compensation that previously were the exclusive domain of top executives. The movement is slow, and it apparently was slackened last year by the recession. Nonetheless, some managers are obtaining truly unusual extras.

Part I of the Computer Decisions *Salary-Status Survey examined MIS/dp salaries. Part II explores the trends in benefits.*

For the dp manager of one southeastern real estate organization, the term "benefits" is a leftover from the primeval past. In addition to the customary health and pension programs, he gets a rent-free apartment from his employer.

"Extra" is a better word for that kind of perk, and it is a term that is becoming familiar to a small, but growing, number of MIS/dp managers.

A middle-aged dp manager from the Rocky Mountain region, for example, gets time off every day to jog. And for a midwestern dp professional, happiness is the IBM Personal Computer his firm lends him to use at home.

Extras like these obviously give you more compensation, however indirect it may be. But they also give you enhanced status within your company's hierarchy. Until very recently, only top executives could hope for such lucrative privileges.

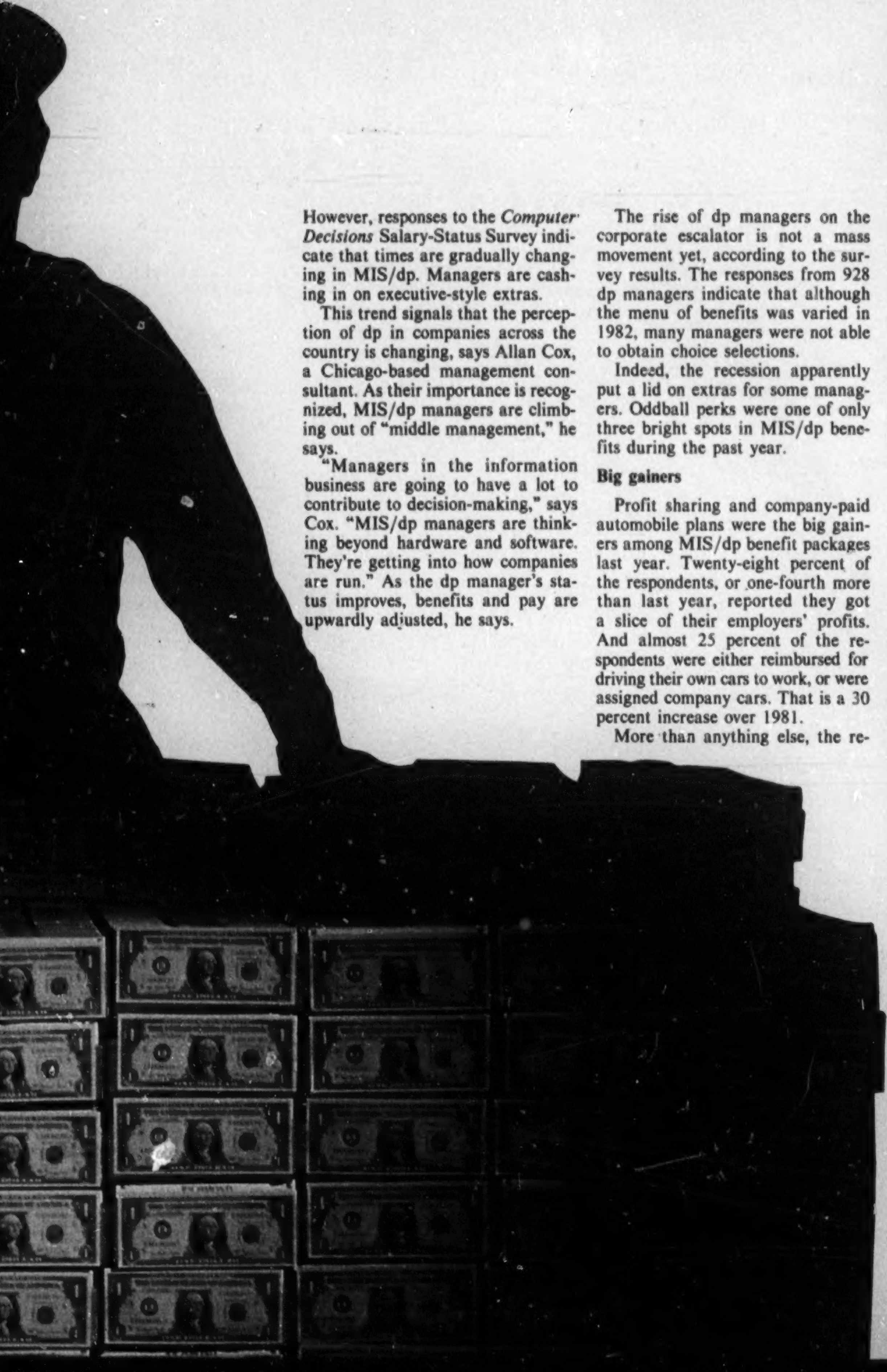


Photo by The Image Bank

However, responses to the *Computer Decisions* Salary-Status Survey indicate that times are gradually changing in MIS/dp. Managers are cashing in on executive-style extras.

This trend signals that the perception of dp in companies across the country is changing, says Allan Cox, a Chicago-based management consultant. As their importance is recognized, MIS/dp managers are climbing out of "middle management," he says.

"Managers in the information business are going to have a lot to contribute to decision-making," says Cox. "MIS/dp managers are thinking beyond hardware and software. They're getting into how companies are run." As the dp manager's status improves, benefits and pay are upwardly adjusted, he says.

The rise of dp managers on the corporate escalator is not a mass movement yet, according to the survey results. The responses from 928 dp managers indicate that although the menu of benefits was varied in 1982, many managers were not able to obtain choice selections.

Indeed, the recession apparently put a lid on extras for some managers. Oddball perks were one of only three bright spots in MIS/dp benefits during the past year.

Big gainers

Profit sharing and company-paid automobile plans were the big gainers among MIS/dp benefit packages last year. Twenty-eight percent of the respondents, or one-fourth more than last year, reported they got a slice of their employers' profits. And almost 25 percent of the respondents were either reimbursed for driving their own cars to work, or were assigned company cars. That is a 30 percent increase over 1981.

More than anything else, the re-

(Continued from page 95)

Disaster insurance

A Canadian organization offers a benefit that acts as a safety net if you lose your job. Gestas Inc. of Montreal currently offers its job-loss insurance in Canada only, but a spokesman says the firm may expand into the United States within the year.

The idea is simple. You pay 1.6 percent of your gross earnings as annual premiums. If you lose your job, you get the aftertax salary, bonuses, and fringes you would have received from your employer for six months to two years.

Gestas also helps you find a new job. And if your new salary is less than your old one, the firm will supplement your earnings by up to 25 percent.

Write Gestas Inc. at 410 St. Nicholas, Montreal, Canada H2Y2P5.

cession probably prevented MIS/dp managers from gaining even more last year, says Anthony L. Drapelick, director of data processing career management at Connecticut General Life Insurance Co. in Hartford. The state of the economy slowed gains in both wages and benefits, he says.

"In a recession, the tendency is to freeze benefits," says Drapelick. "Benefits won't be reduced, but they certainly won't be enhanced either."

Down side

Two of the 18 categories surveyed declined during 1982. Fewer managers said they received moving-expense reimbursements. And the number reporting an unusually high number of holidays and vacation days also dropped.

Even stock-option plans remained static, bucking an upward national trend. The Economic Recovery Tax Act of 1981 encourages companies to embrace this form of compensation, but there has been no rush to give stock options to MIS/dp managers. Indeed, managers are lagging behind other executives, according to figures compiled by Peat, Marwick, Mitchell & Co., a New York-based accounting firm. Forty-three percent of the companies studied by Peat, Marwick gave their executives stock options in 1981. Only 14 percent of the respondents to the *Computer Decisions* survey received options last year. Perhaps this statistic indicates that many managers have a long way to go before they gain executive status.

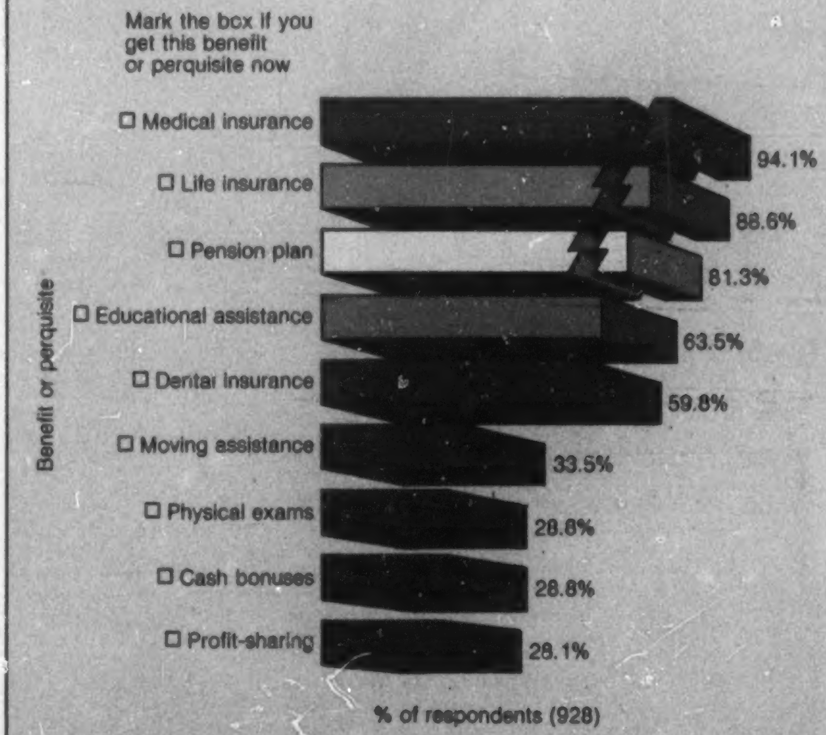
Cash bonuses, on the other hand, are far more common among MIS/dp managers. Three out of five respondents receive them.

A minority of survey respondents complained that their benefits were substandard. Ironically, many of these responses came from industrial dp managers, who traditionally have enjoyed the best in benefits and pay. A manager from Ohio scrawled "None of the above" next to the list of 18 benefits on the survey form. "No perks here," wrote a manager working for a San Jose, CA, manufacturer. A government manager from Seattle reported that he received only a bare-bones benefits package. But he added a "hidden" benefit to the list. "Security," he wrote.

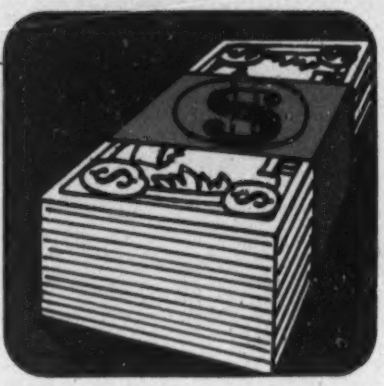
The MIS/dp managers who receive extras like home computers and personal-fitness time allowances are

Self-evaluation: Check your benefits and perks against others'

Benefits and perquisites MIS/dp



Note: The Big Five benefits, those enjoyed by a majority of respondents, are at the top of the list, on the left side. Also, the percentages add up to more than



the lucky ones. More standard extras, like company-paid legal fees, physical exams, and eye care, are a little more common. But responses to the survey indicate that many managers are still trying to build on the "Big Five" benefits.

Medical, dental, and life insurance; pension plans; and educational assistance—the Big Five—are widely offered by companies to their MIS/dp managers. Of the respondents, 94 percent receive company-paid medical insurance; 88.6 percent get life insurance; 81.3 percent are enrolled in company-subsidized pension plans; 63.5 percent are eligible for educational aid; and almost 60 percent have dental insurance.

Then there's a minority receiving valuable benefits that probably never will be enjoyed by more than a few. For instance, somewhat more than a fourth of the managers responding get physical exams they don't pay for. At the same time, about one-fifth say they get benefits from optometric insurance plans (i.e., eye exams, eyeglasses, etc.). By contrast, legal services haven't caught on with employers and employees, from reports of those who follow the trends. In the *Computer Decisions* survey, just 3.2 percent of respondents confirm that they get legal help through their employers.

The value of these packages alone can augment a dp manager's salary by up to 40 percent, according to figures compiled by Hewitt Associates, a compensation consulting firm in Chicago. The nationwide average is 37 percent, according to the U.S. Chamber of Commerce.

That means that the MIS/dp manager who earns the $37,112 median salary reported in the survey enjoys $13,900 a year in untaxed, indirect compensation. If a manager receives stock options, society memberships, physical exams, and other "executive" perks, the value of this compensation obviously rises.

More is better

All of which raises a sticky issue. If even boiler-plate benefits are worth so much, can companies be expected to dole out much more in extras year after year? Probably not, says Drapelick. "No company I know of precipitously changes benefits," he says.

Drapelick takes another view of benefits from his vantage point as an employee of an insurance company. "It's become a little more difficult for an insurance company to sell *new* benefits. But I see no retrenchment on benefits, which have almost become entitlements for dp and other employees. It's difficult for managements to mess around with entitlements."

And yet, the free apartments of this world suggest that there are ways to enhance your package of extras. The first road to better benefits is a higher salary and more substantial responsibility in your company's chain of command. The survey results indicate that MIS/dp managers who supervise large departments and budgets, and are highly paid, get more attractive extras.

Slightly more than one-third of the respondents earning $15,001 to $25,000 receive company-paid dental

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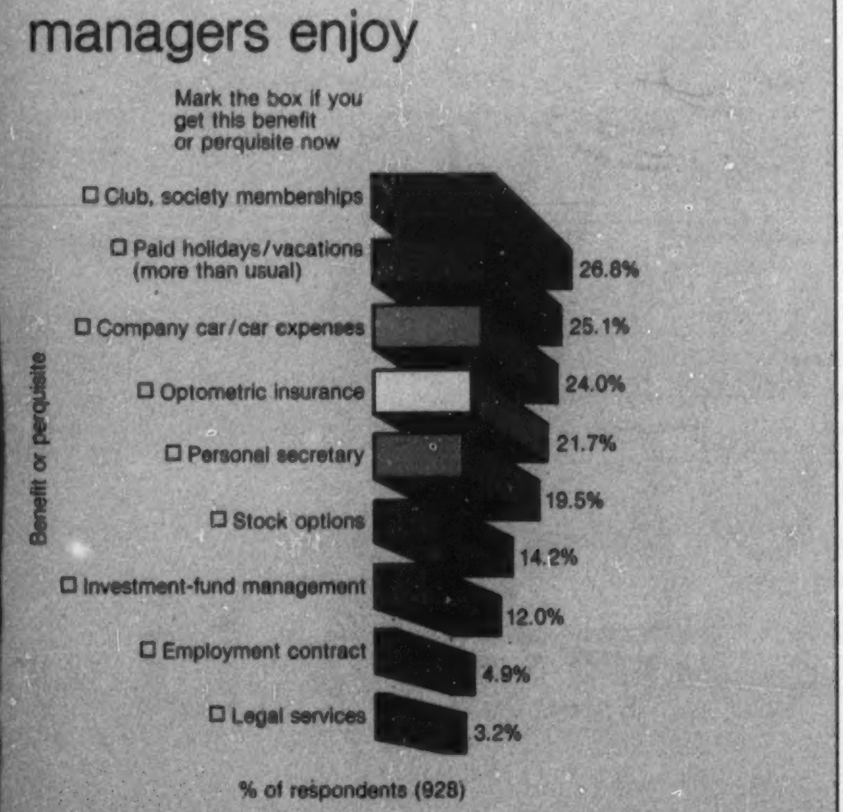


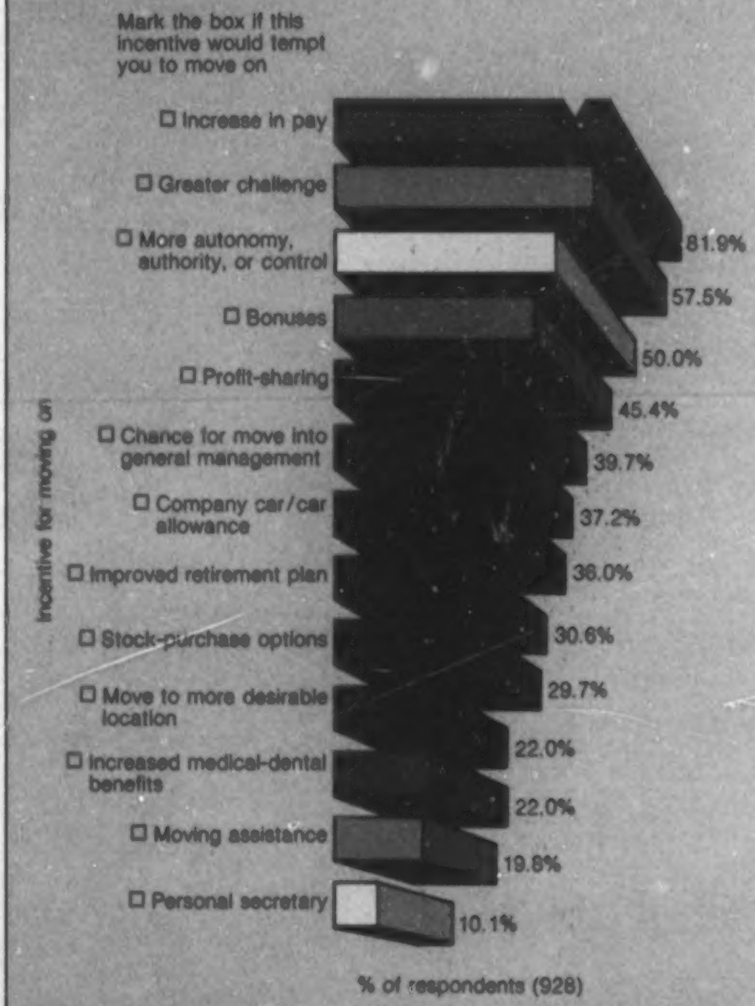
100 percent because most respondents checked off more than one item each on the questionnaire.

(Continued from page 97)

insurance. But more than 90 percent of those with $60,001 to $70,000 salaries get that extra. In the latter earnings category, three out of five managers have personal secretaries. One of 20 respondents earning $25,001 to $30,000 have secretaries. Even educational assistance, a bedrock benefit for many managers, is made available to more professionals in the higher salary brackets, according to the survey results.

Respondents in higher salary brackets also indicated they got more cash bonuses, stock options, investment-fund management plans, company-paid physical exams, and moving expenses than those with lower earnings.

To some extent, the area of the country and economic sector you work in also determines the quality of your benefits, according to the survey results. Salaries and benefits are highest in manufacturing, and the middle Atlantic states—New York, New Jersey, and Pennsylvania—provide the best total compensation packages. Education is the lowest-paying field. And if you are a dp manager for an educational institution in the south Atlantic region, you receive the worst average total compensation available. The south Atlantic region stretches along the East Coast from Virginia to Florida.



Self-evaluation: Check your motives for moving on

Incentives that would prompt managers to switch jobs

Note: The percentages add up to more than 100 percent because most respondents checked off more than one item each on the questionnaire.

Profit sharing and company-paid automobile plans were the big gainers among MIS/dp benefits last year.

MIS/dp managers also might get better extras out of their employers by demanding them, says Graef S. Crystal of the Towers, Perrin, Forster & Crosby compensation consulting firm (New York). Managers should view themselves as valuable issues on a stock exchange, says Crystal. When you seek to improve your earnings, he says, don't forget benefits. Executive-style perks that are worth time and money fall into this category.

"Ultimately, everyone in a free-market economy is paid, on average, what they're worth. It's like the stock market. If you're earning $50,000 a year and think you should get more, you're free to offer your stock for sale." This may involve leaving your current position, he says.

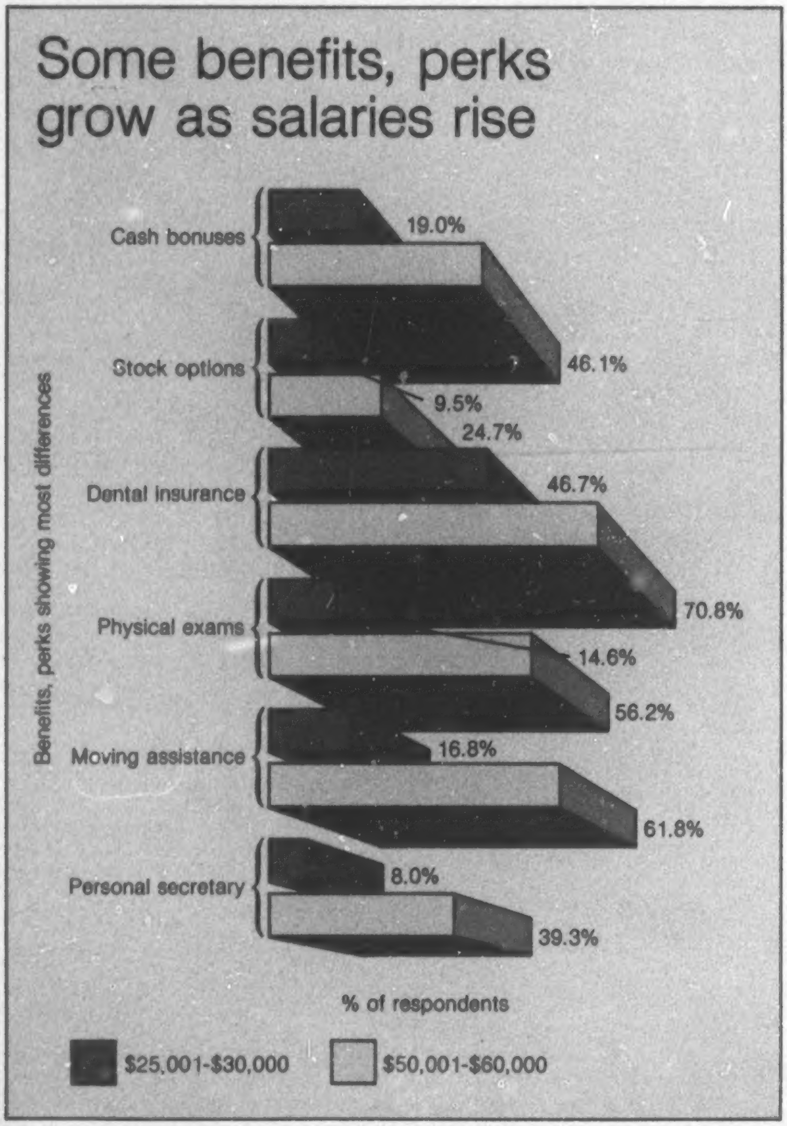
You may not get a free apartment, but the responses of managers from around the country demonstrate that anything is possible. For example:

(Continued from page 100)

- A dp manager from the midwest reports, "I get every other Friday off in return for working 45 minutes extra each day."
- A wholesale-retail dp manager from Buffalo, NY, gets an executive discount on merchandise.
- At a municipal hospital in New York City, a manager is given an annuity.
- A manager from North Carolina is permitted to do outside consulting work, which supplements his salary to the tune of $3,000 a year. (See "Moonlighting: A double standard?" in this issue.)

Your professional qualifications might also be used as leverage to obtain an employment contract, says Crystal. Of the respondents to the survey, only one in 20 has a contract.

If time off and expense money for meetings and conferences can be considered benefits, then nearly three out of four respondents have benefited in 1982. They've attended trade shows, professional-society conferences, or user-group conferences during the year. Almost half took in trade shows and about two out of five, each of the others.


Some benefits, perks grow as salaries rise

MIS/dp managers expect to receive the core benefits from their employers, and most do. But aside from making comparisons with others in the field, just how important are extras in the larger framework of the average dp-er's career? The survey results help to illuminate this question.

First, most managers are satisfied that their benefits and extras are comparable to those prevalent throughout the industry. When asked to rate their packages on a scale of one (much worse than others) to five (much better than others), almost 75 percent came down in the middle, or "about the same as other managers." Only 10 percent of the respondents were on the negative side of this neutral response, and 20 percent considered their extras to be extraordinary.

> "In a recession, benefits won't be reduced, but they certainly won't be enhanced either."
>
> *Drapelick, Connecticut General*

Based on that section of the survey, one might begin to suspect that benefits are of secondary importance to managers. That impression is strengthened by the responses to another question. When asked which factors motivated their subordinates, MIS/dp managers ranked "benefits and incentives" fifth. Pay increases (65.3 percent), working with new technology (58.5 percent), challenges (56.4 percent), and variety of tasks (47 percent) ranked higher.

(In answering another questionnaire, respondents declare they're spending 46 percent of their 1983 budget for staff compensation—both salaries and benefits. That staff typically consists of nine employees.

Probably the best way to gauge the

(Continued on page 106)

Salary-Status Survey

(Continued from page 102)

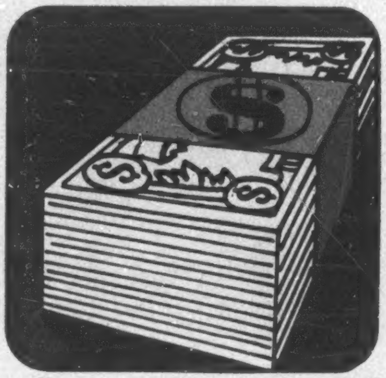
importance of benefits to managers is to examine the factors that would prompt them to change jobs. In this regard, survey responses confirm that benefits and extras are of secondary importance to most managers.

More than 80 percent of the respondents indicated they would leave their jobs for an increase in pay. (The average increase required was 21 percent.) But after that, a greater challenge (57.5 percent) and more autonomy, authority, and control over operations (50 percent) were the most moving factors for managers.

The survey indicates that times gradually are changing in MIS/dp. Managers are cashing in on executive extras.

The dp manager at an Arizona medical center elaborated on this concept. "I'd like more say in the direction of dp," he wrote. "And I'd like to be recognized for the impact dp has on the organization."

"A commitment to keep dp growing and expanding, and sufficient staff to meet project requirements" are most important to a West Coast manager. These responses suggest that MIS/dp managers want to gain not only the pay and prerogatives of executiveship, but the recognition as well. □



A note on how this survey was conducted: The response of readers to the Computer Decisions *Salary-Status Survey was impressive. Very nearly 19 percent of the 4,908 MIS/dp managers contacted by mail filled out questionnaires, to produce a substantial return. (No special inducements were offered.) Each recipient was asked to answer 45 questions, some quite detailed, spread over four pages. The response is a testimony to reader loyalty and interest. And the volume of answers makes the figures statistically valid and projectable in most instances.*

The February issue of this magazine carried the first installment of the survey results. That article covered salaries of MIS/dp managers, factors that affect salaries, managers' interest in moving up into general management or on to other organizations, and their feelings about compensation. To cite perhaps the most important figure, the typical salary—the median, or middle salary—was $37,112 for 1982.

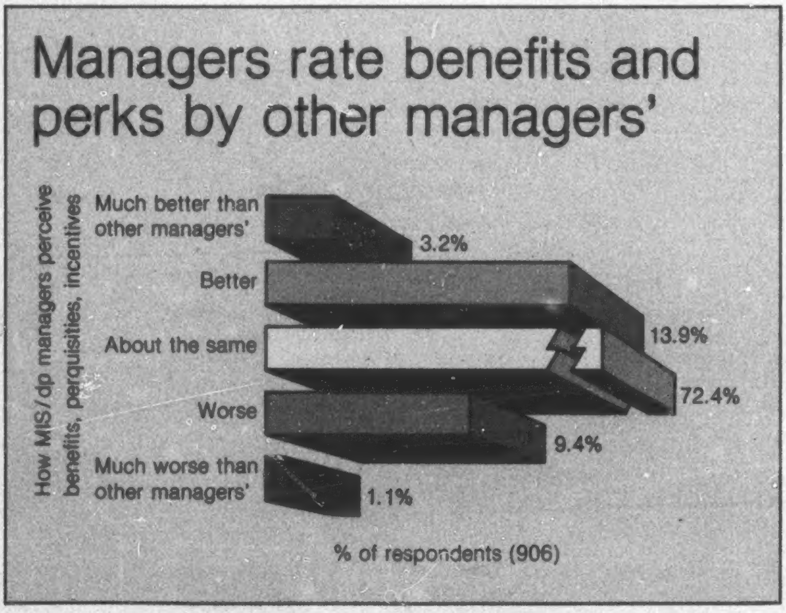
Dp managers who work in education in the south Atlantic region get the worst total compensation available.

Here's more on how the survey was conducted:

- *The 120,000-name circulation list of* Computer Decisions *was culled to produce a list of MIS/dp managers, who constitute about 45 percent of the magazine's readership. Then enough names were randomly computer-selected to make up a mailing of nearly 5,000 questionnaires.*
- *Under these conditions, every reader with a manager's title or its equivalent had about one chance in 11 of receiving a questionnaire.*
- *Not all respondents answered all questions, naturally; that's why somewhat fewer than 928 replies may be noted in the text and bar charts.*
- *Managers returned questionnaires last fall, chiefly during the month of October, for processing under the auspices of the Research Department of Hayden Publishing Co.*

In addition, a number of MIS/dp managers volunteered comments about work and working conditions. Those answers will aid Computer Decisions' *editors in developing articles for future publications.*

Managers rate benefits and perks by other managers'



COMPUTER DECISIONS

APRIL 1983

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Recovering from mistakes

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Computer supplies

Gearing up for ddp

IBM: Wall Street's darling again

Networking micros

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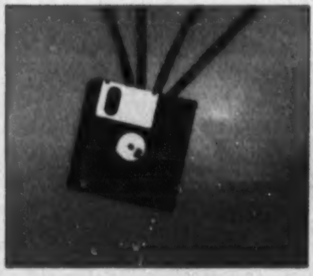

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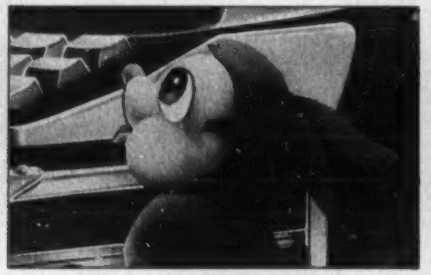

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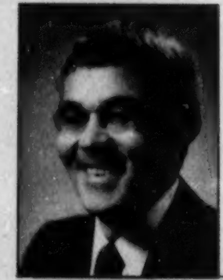

by Gideon I. Gartner

FOLLOWING THE LEADERS

IBM: Wall Street's darling again

You'd think Wall Street's 10-year disenchantment with IBM never happened. Investors, individual and institutional, have fallen in love with Big Blue again.

Are they right? I think so. IBM is once again rated a "growth" company.

Few can now recognize IBM as it was 10—nay, five—years ago. It is building robots, offering videotex services, accelerating its PBX activities, selling laboratory and industrial instruments, spending lots of money on biomedical systems, and offering to write programs for customers.

In marketing, IBM is not only offering more volume discounts than ever, but making special deals. It is already using many new marketing channels, such as independent stores, and all sorts of third parties.

IBM also looks like a different company financially. For example, it used to be financially conservative, having almost no debt, and adding capacity slowly. Now, IBM finances its growth primarily with debt and accepts risks by adding capacity rapidly, in fact ahead of demand.

In pricing, not only is IBM forgetting about charging a premium price, but it is changing its emphasis from rent, to lease, to purchase.

Well, to some of us, the transformation of IBM comes as no surprise. In fact, IBM was also transformed about 25 years ago, in the middle 1950s. At that time, IBM was facing loss of control of the market for punchcard equipment, because of competition, new technologies, and government intervention. As a result, the company settled with the U.S. government in 1956, conceded the punchcard market, and then proceeded to render that market obsolete with its own stored-program computers.

Likewise, by the middle 1970s, IBM was facing loss of control of the stored-program computer market, again because of competition, new technologies and methods, and government intervention. So in 1982, just about 25 years after the prior settlement, IBM again shook off the U.S. government—but not before it put in place a new set of strategies aimed at confusing its competition, maintaining a relatively dominant position worldwide, and meeting its new growth objectives.

What are the revised growth objectives IBM may aim for over the next 25 years? We can deduce these by analyzing the market-share situation. The Gartner Group surveys all U.S. computer-industry vendors every few months and compiles various statistics about them. During the past three years, IBM's share of worldwide computer revenues held by American companies was 39.7 percent, 38.4 percent, and 38.1 percent, respectively. This declining trend has been steady for years, and we believe that IBM is now determined to halt the erosion of its share of market. Our perception of the computer industry's trend-line growth for the next five years is 15 to 20 percent annually. We think IBM has the same perception and will try to hold its market share. This means IBM must strive to grow, on average, 15 percent—perhaps even 16 percent—per year.

One problem with such a goal is that it is not so simple for a company that grossed over $30 billion last year to increase its trend-line growth by as much as three percentage points! For the last 10 years, IBM grew only 13 percent a year on average.

What effect could a higher IBM growth rate have on the rest of the computer industry? There are two scenarios (or some mix of the two):

IBM's 1981 revenues compounded to 1991

(Dollars in billions)

Compound growth rate	1981	1991	1982-91 total
16%	$29	$128	$717
13%	$29	$100	$603
Difference		$ 28	$114

FOLLOWING THE LEADERS

IBM either expands the entire industry size or eats into the revenues of its competitors. It has become a cliché that each time IBM takes some aggressive action, its competition says that the market has expanded. This is oversimplifying the situation, since there are limits to the rate at which the market can absorb computer power.

The difference between projecting IBM's growth rate at 13 percent and 16 percent is $28 billion in 1991 alone, and is cumulatively $114 billion between now and 1991 (see table, "IBM's 1981 revenues compounded to 1991"). If we assume, for simplicity, that IBM's total revenue base is in "information processing," and, as an extreme, that the aggregate market growth is independent of IBM action, then this $114 billion is revenue which will go either into IBM's pockets or its competitors'.

Some may refuse to believe that a company with IBM's revenues can substantially increase its long-term growth rate and expand at 16 percent per year. So let's consider: Is 16 percent too much?

Let me relate IBM objectives to the gross national product. IBM's 1981 total revenues were almost exactly one percent of 1981's GNP. If the GNP is growing at a nominal 10 percent per year, including inflation, then our calculations show that by 1991, IBM's revenues would equal 1.7 percent of the U.S. GNP. That is not beyond reason, especially if we are moving into an information age.

An interesting study on computer demand, "Use Managers Systems Need," came out of the Massachusetts Institute of Technology in May of 1980. The logic of the study was somewhat complex, but it articulated the concept of "invisible demand," a concept the M.I.T. researchers called "devastating" because of its size. "Invisible backlog" is demand that users can articulate, but which is not currently scheduled. The conclusion of the M.I.T. study was that only 17 percent of the existing installed base of applications systems were relevant and appropriate to users' important computer needs. And 35 percent of important activities, which could be supported by computing, had no support at all. And, of course, there are hundreds of 1980s applications that users don't know yet they will want.

Specifically, the study concluded that existing application backlogs represented a growth of 68 percent of the installed base, but the invisible backlog was as much as 112 percent of the existing installed base. Much of this invisible demand, of course, will be instigated by end users.

The 1970s saw the beginning of the end-user revolution, with the explosion in use of minicomputers and distributed processing. But now, lower-cost, highly functional, and easy-to-use workstations and microcomputers, capitalizing on cheap and powerful new technologies, are becoming even more irresistible. While the cost of a typical workstation may have represented 50 percent of the typical annual cost of a professional as recently as 1977, it will only cost five percent by 1987 (see table, "Projections for the workstation market").

Projections for the workstation market

	1977	1982	1987	Compound growth rate
Loaded workstation price	$15,000	$7,500	$3,750	
Avg. annual professional salary	$30,000	$50,000	$70,000	
Ratio	0.5	0.15	0.05	
Units (thousands)	100	600	3,600	43%
Market (billions)	$1.5	$4.5	$13.5	24%

There will be little reason not to have at least one workstation per professional by the late 1980s. And this projection ignores workstations for nonprofessional office workers. So I am confident that the unit growth of workstations will continue to increase at a compound annual rate exceeding 40 percent.

Of course, IBM won't corral all of this market, but it will get much of it. While IBM was *inappropriately* late in minicomputers, it is *appropriately* late in workstations. For example, shipments of the IBM Personal Computer, a little more than one year old, may soon exceed the shipments of any of the major competitors: from 40,000 units in 1981, when it was introduced, to over 150,000 last year, to well over 400,000 this year.

That represents about $1.5 billion in revenues, not including hardware add-ons to the base, additional software, or maintenance fees. The IBM name still seems to hold some magic, ironically, if only for the general public. A whole new sub-industry is building around the IBM PC, just as one did around the Apple II.

But, as you know, the issue really isn't personal computers, it's personal computing, and IBM's activities in this broader market are also very visible. Besides personal computers and Displaywriter word processors, each overlapping the other (and both now very connectable to larger cluster controllers and mainframes), IBM continues to emphasize in-house timesharing and public time-

(Continued on page 70)

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FOLLOWING THE LEADERS

(Continued from page 66)

sharing through its new Information Network.

The Information Network is IBM's new service offering in the United States. IBM, of course, was excluded from the service-bureau business for six years after it sold the Service Bureau Company to Control Data Corporation. But now that this prohibition has expired, IBM would like its customers to support timesharing actively, whether in-house or public, through the information-center concept.

IBM, moreover, is using the information-center concept to sell equipment. For example, since IBM has a few spare 3033s in inventory these days, and many more (still at customer locations) scheduled to be displaced, it is trying to convince users to dedicate 3033s as information centers to serve the organizations' end users. IBM's Information Network in the United States, among many other functions, offers similar end-user facilities, but with the advantage of sharing of resources, which lowers the user's fixed cost. Another advantage of the Information Network is that it allows IBM to act as a facilities manager, which simplifies the user's installation-management job.

IBM faces a tough problem, though: It needs to jump on the distributed and end-user bandwagons, but at the same time it wants to support the "central buying entity" (the vice president or director of MIS/dp). The concepts of distributed and central seem mutually exclusive, but IBM wants both. The reason is simple: IBM knows how to sell efficiently to central buying points, but demand there has been weak; it is still learning how to sell efficiently elsewhere, where demand is strong.

What IBM is trying to do, therefore, is to be the best friend of the central-site manager. Just when the corporate central MIS/dp department appears to be losing control, IBM is offering a variety of tools to help the central information-handling manager better serve the end user and reassert control. In fact, the weakening of the dp manager and the data center may already have more or less run its course. Many of these managers understand the long-term threat to their positions and are accepting the help (even if it's selfish help) that IBM and some other mainframe vendors are offering.

IBM's Information Network timesharing service will be of great importance in the long run. We forecast that the direct and indirect revenues IBM will obtain in the United States only from the Information Network would be $2.5 billion annually within five years. This may sound high, but by late century—as both IBM and Japanese vendors provide vast amounts of computer power very cheaply, using fifth-, sixth-, or whatever-generation hardware—IBM may be in an excellent position to deliver computer power as a utility delivers electrical power today.

Returning to the subject of end-user demand, consider this remark by the dp manager of a major oil company: "We're driven by the fact that the cost of the terminal interface is greater on the human side than it is on the equipment side, regardless of what application you're talking about. And those costs are diverging. We will never again worry about the cost of equipment or communication systems. We will manage those costs; we won't worry about them." ☐

This is the first part of a two-part article. The conclusion will appear next month. Gideon I. Gartner is founder and president of the Gartner Group Inc., 72 Cummings Point Rd., Stamford, CT 06904, (203) 964-0096. The professional services firm provides continuous tracking and analysis of the information industry to users of electronic information and information-processing equipment.

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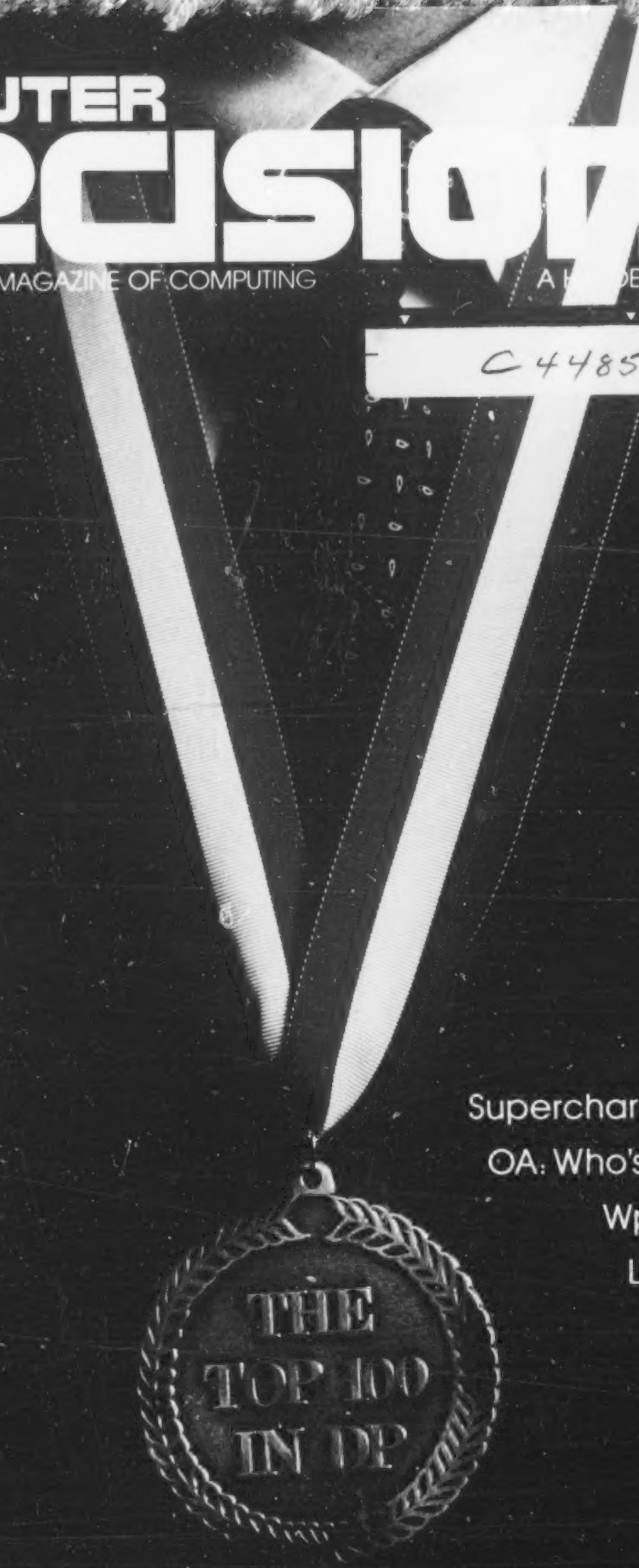

Supercharged micros

OA: Who's in charge?

Wp packages

LANs deliver

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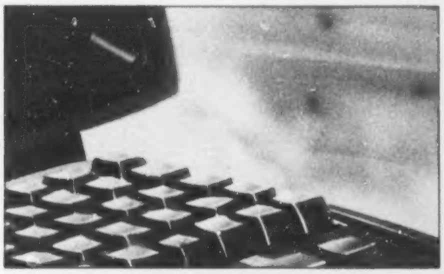

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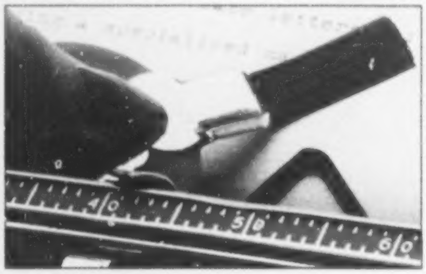

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COMPUTER DECISIONS

THE MANAGEMENT MAGAZINE OF COMPUTING

JUNE 1983

THE
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CIRCLE 100

THE
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IN DP

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TOP 100 IN DP

Again in 1982, the Top 100 dp vendors seemed to be in an almost recession-proof business.

by Lawrence M. Honig

Data processing—the flagship high-technology industry of America—has once again broken records. The suppliers of dp hardware, software, and services have come through the toughest recession in eight years with colors flying and seem poised for explosive growth in the developing economic recovery.

Major developments of 1982 included the by-now well recognized major thrust by IBM and the squeezing of minicomputers by both micros and mainframes. (Sales of mainframes last year actually grew faster than those of minis, an unforeseen turn.)

Led by IBM, the 100 largest vendors in the dp industry experienced strong growth during the 1982 calendar year, recording aggregate revenues of $78,382.5 million. Much of this surprising performance came in the second half of last year. (Regular readers of *Computer Decisions* will recall my prediction in the January 1983 "Following the leaders" column that 1982 Top 100 dp revenues would total "almost $75 billion.")

To put these results in perspective: $78,382.5 million represents a nominal increase of 20 percent over the $65,313.4 million in dp revenues generated by the same 100 vendors in 1981. (The 1981 Top 100 list, comprising a slightly different population, generated $65,917.7 million in 1981, so 1982's Top 100 grew a nominal 18.9 percent compared to 1981's list.) Adjusting these results for inflation (using the government's deflator statistic of 4 percent), we find that the 1982 Top 100 list experienced 16.2 percent real (constant-dollar) growth. Meanwhile, the real (inflation-adjusted) gross national product actually fell 1.2 percent in 1982.

By comparison, the 1981 Top 100 experienced 8.53 percent real growth (19.8 percent nominal growth) as the economy contracted. Although there are, of course, examples of year-to-year or quarter-to-quarter revenue declines, on balance, the dp industry—as measured by its Top 100—has grown strongly and consistently.

The cutoff point—the revenues required to be a Top 100 company in 1982—rose 23 percent above 1981's level. The No. 100 vendor in 1981, MSI Data, had dp revenues of $56.9 million. The last company on the 1982 list is American Management Systems, which recorded dp revenues of $70 million.

Despite this significant rise, only five of the companies listed in 1981 failed to make the latest Top 100. MSI Data, Exxon Office Systems, and Computer Automation did not generate enough business to be included, while Four Phase Systems and Memorex were merged into No. 22 Motorola and No. 3 Burroughs, respectively. New to the ranks of the Top 100 are Decision Data (No. 95), whose revenues increased 48.3 percent; Cipher Data Products (No. 99), a streaming tape drive maker, whose revenues surged 111.2 percent; Anacomp (No. 97), a service operation that was ranked No. 96 on 1980's list; and terminal/micro maker Televideo Systems (No. 84), which led the revenue growth list (Chart 3) with a tremendous 184 percent year-on-year increase. Philips Information Systems (Micom) is also new to the list this year, although it should have been included on last year's list. A

This is the fourth consecutive year that Gartner Group has prepared its list and analysis of the Top 100 data-processing vendors and the second year in which it has appeared exclusively in Computer Decisions.

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THE
TOP 100
IN DP

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Chart 1

The Top 100

U.S.-based vendors, ranked by 1982 dp revenues. (Dollars in millions)

	Rankings			Company	Dp revenues		
	'82	'81	'80		'82	'81	'80
	1	1	1	IBM	$31,467.6	$25,111.0	$21,367.0
	2	2	3	DEC	4,019.0	3,586.6	2,743.3
•	3	4	6	Burroughs	3,809.5	2,934.0	2,478.0
	4	3	2	Control Data	3,301.1	3,120.4	2,771.7
	5	5	4	NCR	2,915.3	2,838.0	2,714.0
	6	6	5	Sperry	2,800.5	2,781.0	2,552.0
	7	7	8	Hewlett-Packard	2,268.0	1,875.0	1,583.0
	8	8	7	Honeywell	1,685.0	1,774.0	1,634.1
	9	9	12	Wang Labs	1,321.5	1,008.5	681.8
	10	10	14	Storage Technology	1,030.0	890.9	603.5
	11	11	9	Xerox	975.0	872.0	770.0
	12	12	10	TRW	958.5	855.0	750.0
•	13	14	18	General Electric	850.0	735.0	475.0
	14	13	13	Data General	803.8	764.3	672.8
	15	16	15	Texas Instruments	746.7	640.0	562.0
•	16	20	34	Tandy (Radio Shack)	725.0	460.0	220.0
	17	18	17	Automatic Data Processing	704.0	613.0	507.0
	18	17	16	Computer Sciences	683.4	624.7	560.3
•	19	23	47	Apple Computer	663.8	400.7	165.2
	20	19	20	Electronic Data Syst.	555.6	480.6	408.5
	21	21	22	Datapoint	514.0	453.0	364.0
•	22	47	51	Motorola	484.9	180.0	140.0
	23	27	26	McDonnell Douglas	476.0	346.5	280.0
	24	22	21	Amdahl	462.2	442.8	394.4
	25	25	28	Prime Computer	435.8	364.8	267.6
•	26	49	66	Commodore Int'l.	420.0	176.0	98.7
•	27	29	39	National Semiconductor	387.1	320.0	206.0
	28	24	19	Teletype	377.6	368.4	416.4
	29	30	27	Mohawk Data Sciences	355.5	314.0	277.7
	30	26	24	Management Assistance	354.2	349.1	310.4
	31	31	29	Harris	342.1	313.0	260.0
	32	32	25	Tektronix	336.2	308.9	286.4
	33	36	33	Raytheon Data Syst.	336.0	260.0	225.0
•	34	39	54	Tandem Computers	330.9	242.5	128.8
	35	28	23	Triumph-Adler	326.7	320.0	325.0
	36	45	43	C. Itoh Electronics	326.4	213.0	189.0
	37	33	35	Gould-SEL	325.0	280.0	220.0
	38	34	42	Computervision	323.8	270.7	191.1
•	39	71	127	Warner Communications	310.0	115.0	20.0
	40	40	37	Racal Electronics	300.0	240.0	212.0
	41	35	31	Dataproducts	297.6	270.0	248.3
	42	38	38	Tymshare	297.0	246.8	211.0
	43	42	32	Perkin-Elmer	267.4	226.6	226.0
	44	37	30	ITT	265.0	250.0	250.0
•	45	46	50	Boeing Computer Svcs.	263.7	205.5	140.3
	46	43	36	Northern Telecom	237.4	222.0	217.1
	47	44	40	3M	223.1	220.0	205.0
•	48	61	77	Paradyne	207.3	135.4	75.9
•	49	59	80	Philips Information Syst.	203.0	140.0	68.0
	50	48	49	Sanders Assoc.	202.6	180.0	145.0

Notes:

n/m = not meaningful

n/a = not available

• = company moved up in ranking two consecutive years

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THE TOP 100 IN DP

	Rankings '82	'81	'80	Company	Dp revenues '82	'81	'80
	51	52	n/m	Allied Corp.	195.0	160.0	n/a
•	52	58	60	Telex	194.7	142.7	117.9
	53	51	55	Lanier Business Prods.	194.2	161.0	128.0
	54	50	n/m	M/A Com	190.0	171.0	n/a
	55	53	52	Nixdorf Computer	186.2	159.3	137.8
•	56	92	124	Tandon	177.1	70.4	29.0
	57	55	n/m	Schlumberger	175.0	148.0	n/a
	58	54	59	Informatics General	170.2	150.3	125.9
•	59	63	64	Shared Medical Syst.	165.8	131.6	105.6
	60	56	46	Signal (Ampex)	163.0	147.0	169.7
•	61	65	76	CPT	158.6	123.8	76.7
•	62	79	88	Intergraph	155.6	91.1	56.5
	63	62	45	General Instrument	152.2	135.0	172.0
•	64	66	70	Sun Information Svcs.	152.0	121.8	86.9
	65	60	56	United Telecommunications	148.7	137.4	127.7
	66	67	57	Planning Research	146.8	117.2	127.4
•	67	72	83	Dysan	142.8	104.2	62.9
•	68	75	84	Cray Research	141.1	101.6	60.7
	69	57	62	Wyly	140.5	146.8	117.8
	70	77	74	Martin Marietta Data Syst.	124.0	99.2	78.1
•	71	80	82	Quotron Syst.	120.9	88.1	63.8
	72	70	61	Reynolds & Reynolds	119.7	115.4	117.8
•	73	87	109	NBI	119.5	76.7	43.2
	74	64	63	Recognition Equipment	119.5	131.5	113.1
	75	73	69	Bradford Nat'l.	115.4	102.0	87.6
	76	68	53	Centronics Data Computer	112.7	115.9	128.9
	77	76	67	Dun & Bradstreet	110.0	100.0	96.7
	78	74	75	Gerber Scientific	107.2	101.9	78.0
•	79	85	94	American Express	106.0	81.0	53.0
	80	78	81	Commerce Clearing House	104.5	92.0	67.4
•	81	88	93	National Data	102.7	71.9	53.0
	82	91	91	Management Science America	101.2	70.6	53.2
•	83	90	110	Zenith Data Syst.	100.0	71.0	43.0
•	84	125	130	Televideo Syst.	98.5	34.7	12.7
	85	84	79	Chase Manhattan	95.8	81.1	69.0
	86	81	73	Modular Computer Syst.	92.8	87.2	81.1
•	87	93	99	Verbatim	91.9	68.6	48.4
	88	69	58	General Automation	89.6	115.6	126.7
	89	86	85	Triad Syst.	89.2	79.1	60.2
	90	82	78	Lear Siegler	88.0	85.0	75.0
•	91	101	111	Floating Point Syst.	86.6	57.9	42.4
•	92	97	98	Printronix	77.4	60.2	48.9
	93	83	68	Comshare	77.4	82.4	88.2
•	94	95	114	Systems Industries	75.4	62.9	37.9
	95	100	89	Nashua	74.8	58.0	53.5
	96	112	108	Decision Data Computer	74.3	50.1	43.6
	97	104	97	Anacomp	73.9	54.6	50.4
	98	96	105	McGraw-Hill	72.0	61.0	45.0
	99	127	126	Cipher Data Prods.	70.1	33.2	20.3
	100	94	86	American Management Syst.	70.0	65.6	58.5
				Summary:	$78,382.5	$65,313.4	$54,559.4

Alphabetical index to companies in the Top 100 is on page G36.

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THE TOP 100 IN DP

case might be made for including Osborne Computer on this list, too; as of publication, we were not able to derive enough details about this privately held micro maker to substantiate its position, however.

Chart 2

Comparing IBM with the rest of the Top 100 *(Dollars in millions)*

	1982	1981	Change
IBM's dp revenues	$31,467.6	$25,111.0	25.31%
Top 100 dp revenues	78,382.5	65,917.7	18.91
IBM's share	40.15%	38.09%	
Rest of Top 100	46,914.9	40,806.7	14.97

Although no vendor managed to match Warner Communications' 1981 growth-rate performance of 475 percent, six companies more than doubled their business between 1981 and 1982. Only four did so between 1980 and 1981.

IBM increased its dp revenues by 25.31 percent in 1982 and its share of the Top 100 pie from 38.09 percent to 40.15 percent (Chart 2). This arrests the decline in market share that Big Blue has tolerated for the last several years. About 90 percent of IBM's revenue now comes from dp, up from about 87 percent in 1981 and 81 percent in 1980. The other 99 vendors in the Top 100 still managed a highly respectable 14.97 percent year-to-year revenue gain.

(Continued)

Chart 3

Top 20 in revenue-growth rate *(Dollars in millions)*

		Total dp revenue growth '82/'81	U.S. dp revenue growth '82/'81	Foreign dp revenue growth '82/'81	Total dp revenues 1982	1982 Top 100 rank
1	Televideo Syst.	184.0%	196.3%	149.9%	$ 98.5	84
2	Warner Communications	169.6	160.0	233.3	310.0	39
3	Motorola	169.4	169.4	169.4	484.9	22
4	Tandon	151.4	179.1	37.1	177.1	56
5	Commodore Int'l.	138.6	273.3	92.4	420.0	26
6	Cipher Data Prods.	111.2	104.9	147.1	70.1	99
7	Intergraph	70.9	70.9	70.9	155.6	62
8	Apple Computer	65.7	65.7	65.7	663.8	19
9	Tandy (Radio Shack)	57.6	57.6	57.8	725.0	16
10	NBI	55.9	55.9	55.9	119.5	73
11	C. Itoh Electronics	53.2	10.0	102.2	326.4	36
12	Paradyne	53.1	51.1	59.5	207.3	48
13	Floating Point Syst.	49.6	49.6	49.6	86.6	91
14	Decision Data Computer	48.3			74.3	96
15	Philips Information Syst.	45.0	45.0	.0	203.0	49
16	Mgt. Science America	43.4	35.7	76.3	101.2	82
17	National Data	42.8	42.8	.0	102.7	81
18	Zenith Data Syst.	40.8	40.0	42.6	100.0	83
19	Cray Research	38.9	21.6	184.2	141.1	68
20	McDonnell Douglas	37.4	71.3	-71.2	476.0	23

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(Continued from page G12)

In light of the significant acquisitions of dp vendors made over the last several years, it is illuminating that conglomerated companies with the majority of their operations outside dp are not usurping the Top 100 list. Indeed, in 1981, 28 of the Top 100 owed less than 25 percent of their revenues to dp sales. The 1982 Top 100 has only 25 such vendors. However, these companies are growing rapidly in dp; the total dp revenues of the conglomerates rose 23 percent, from $6,670.4 million in 1981 to $8,185.1 million in 1982. The mean rate of dp-revenue increase was even higher—29.68 percent.

Who were the big movers in 1982? A look at Chart 3 shows that six of the top 10 growth-rate leaders are in still-burgeoning microcomputers. OEM Tandon joins Televideo and established micro makers Tandy, Apple, Warner, and Commodore, with Zenith also appearing high in this category. In terms of big moves up the Top 100 ranking ladder, Tandon leads the pack, moving up an astonishing 36 places, from No. 92 on the 1981 list to No. 56 in 1982. Other major gains were scored by Warner (up 32 places, from No. 71 to No. 39), Motorola, Commodore (up 23, from No. 49 to No. 26), and CAD/CAM vendor Intergraph (up 17 places, from No. 79 to No. 62). Apple (No. 23 in 1981, now No. 19) and Tandy (No. 16 in 1982, up from No. 20) both scored four-place gains near the top, where each slot may represent $40 million to $50 million in revenue.

> "The Top 100's combined revenues are more than twice the revenues of the entire domestic housing industry."

Chart 4

Bottom 20

Based on 1982/1981 change in dp revenues (Dollars in millions)

	Dp revenues 1982	Dp revenues 1981	Percent change	Top 100 rank
General Automation	$ 89.6	$ 115.6	-22.49	88
Recognition Equipment	119.5	131.5	-9.13	74
Comshare	77.4	82.4	-6.07	93
Honeywell	1,685.0	1,774.0	-5.02	8
Wyly	140.5	146.8	-4.29	69
Centronics	112.7	115.9	-2.76	76
Sperry	2,800.5	2,781.0	0.70	6
3M	223.1	220.0	1.41	47
Management Assistance	354.2	349.1	1.46	30
Triumph-Adler	326.7	320.0	2.09	35
Teletype	377.6	368.4	2.50	28
NCR	2,915.3	2,838.0	2.72	5
Lear Siegler	88.0	85.0	3.53	90
Reynolds & Reynolds	119.7	115.4	3.73	72
Amdahl	462.2	442.8	4.38	24
Data General	803.8	764.3	5.17	14
Gerber Scientific	107.2	101.9	5.20	78
Control Data	3,301.1	3.120.4	5.79	4
ITT	265.0	250.0	6.00	44
Modular Computer	92.8	87.2	6.42	86

On the other side of the coin, six firms actually dropped in dp revenues in 1982 (Chart 4). Although this is an improvement from 1981, when 11 vendors experienced dp-revenue declines, it is significant that only one of "the bunch"—Burroughs—escaped the latest bottom-20 list. The other four of the five largest mainframe manufacturers after IBM—Control Data, NCR, Sperry, and Honeywell Information Systems—all appear on this list, and Honeywell has the unenviable distinction of being one of the six vendors with a negative growth rate. Since IBM increased its revenues by a substantial sum, this translates into a major loss of market share for the bunch in 1982.

Seven of the bottom 20 are back for a second year: Modcomp, ITT, Triumph-Adler, 3M, Centronics, Comshare, and General Automation.

In terms of dollars gained (Chart 6), IBM again increased its dp revenues by a sum greater than the entire dp revenues of No. 2, Digital Equipment Corp. IBM thus repeats this amazing feat for the fourth year in a row. In fact, IBM's $6,356.2 million gain exceeded the *total* gain for the remaining 99 vendors in the Top 100.

As has been true in the past, revenues from mainframe sales dominate

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the Top 100 product-segment list (Chart 5). In fact, mainframe sales, buoyed by IBM's powerful surge of 308X shipments, grew faster than sales of minis. The fastest growth occurred, as expected, in micros, although the rate has fallen somewhat from the torrid 100 percent pace reported for 1981. That year, for each mainframe dollar spent, 10.3 cents were spent on a micro; for 1982, the figure jumped to 15.9 cents.

Chart 5

Growth by market segment of the Top 100 *(Dollars in millions)*

	1982	1981	Change
Mainframes	$19,594	$16,353	19.82%
Minicomputers	11,436	9,922	15.25
Microcomputers	3,110	1,690	84.07
Office hardware (incl. wp)	2,548	2,029	25.59
OEM peripherals	5,138	4,575	12.31
End-user peripherals	8,700	7,267	19.71
Data communications	1,401	1,156	21.21
Software	4,535	3,600	25.99
Maintenance	11,626	9,962	16.70
Services	8,216	7,052	16.50
Other dp revenues	2,079	1,708	21.69
Total Top 100 dp revenues	$78,382.5	$65,313.4	20.01%

Chart 6

Top 10 in dp-revenue gain

(Dollars in millions)	Dp revenues 1982	Dp revenues 1981	Revenue gain	Top 100 rank
IBM	$31,467.6	$25,111.0	$6,356.6	1
Burroughs	3,809.5	2,934.0	875.5	3
DEC	4,019.0	3,586.6	432.4	2
Hewlett-Packard	2,268.0	1,875.0	393.0	7
Wang Labs.	1,321.5	1,008.5	313.0	9
Motorola	484.9	180.0	304.9	22
Tandy (Radio Shack)	725.0	460.0	265.0	16
Apple Computer	663.8	400.7	263.1	19
Commodore Int'l.	420.0	176.0	244.0	26
Warner Comm.	310.0	115.0	195.0	39

Word processors, now incorporated into a new segment called "office hardware," experienced much slower growth than in 1981, when they represented the fastest product-segment track with a growth rate of 118 percent. The slower growth rate for 1982 reflects both the recession and the squeeze that multifunction micros and integrated-office software packages are placing on the standalone wp market. Nonetheless, the office-hardware/word-processing category did score an impressive 25 percent gain in 1982.

The software category also grew by 25 percent, again a decline from 1981's lofty 59 percent. Software, of course, was growing from a much larger base in 1982, and IBM's unbundling program (the largest factor in 1981's growth) had become quite mature.

The slowest growth occurred in OEM (original-equipment manufacturer) peripherals; despite Tandon's performance, vendors of commodity products for incorporation into other manufacturers' systems experienced the brunt of the business cycle, as far as it was felt by any dp segment.

IBM's surge in profits

IBM earned an estimated $7,250 million in operating profits (Chart 7) from dp sales in 1982, up 22.7 percent from the estimated $5,908 million Big Blue earned in 1981. This represents more than 64 percent of all operating profits earned in the industry by the Top 100, up from 60 percent last year. Clearly, IBM deserves high marks for managing for profitability.

In 1981, IBM trailed both Cray and Shared Medical Systems on the dp-operating-margin list. In 1982, IBM has moved to second place

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(Chart 8) with an operating margin of 23 percent (down slightly from 1981's 23.5 percent). Shared Medical leads the pack with a margin of 24.7 percent. Three of the top 10 in margin are in micros: Apple, Commodore, and Tandy.

For the second consecutive year, C. Itoh Electronics leads the Top 100 in terms of dp revenue per dp employee (Chart 9). As was the case in 1981, IBM scores well in this category, but still not at the top; it was No. 19 on the 1981 list, No. 13 for 1982.

The top 20 for U.S. dp revenues (Chart 10) contains 19 of the Top 20 companies overall: Only Automatic Data Processing is missing, replaced by McAuto's parent, McDonnell Douglas. The top 10 in terms of overseas dp revenues (Chart 11) also includes just one firm not found in the Top 10 overall: Data General replaces Storage Technology.

Currency effects depressed the earnings and revenues of all dp vendors that did business overseas in 1981; the strengthening dollar particularly hurt IBM. For 1982, the effect of the strong greenback was somewhat mitigated by a Financial Accounting Standards Board rule change, which allows corporations to state their overseas results in a more advantageous manner. However, the continued high exchange value of the dollar, coupled with the worldwide economic malaise, did undoubtedly depress the revenue figures for U.S.-headquartered dp vendors with overseas customers.

What are the implications of 1982's Top 100 tabulations? First, the dp industry has continued to expand at such a dramatic rate—in fact, has increased its real rate of

(Continued on page G28)

Chart 7
Ranking by 1982 dp operating profits *(Dollars in millions)*

	1982	1981	Change
IBM	$7,250.4	$5,908.0	22.72%
DEC	668.1	596.2	12.06
NCR	398.0	292.0	36.30
Hewlett-Packard	370.0	314.0	17.83
Burroughs	248.1	269.0	-7.77
Control Data	242.0	274.0	-11.68
Wang Labs.	158.0	112.3	40.69
Tandy (Radio Shack)	155.3	105.0	47.90
Sperry	143.3	178.0	-19.49
Apple Computer	120.0	74.8	60.43

Chart 8
Top 10 by 1982 dp operating margin *(Dollars in millions)*

	1982 dp operating margin	1982 dp operating profits	1981 dp operating profits	1981 dp operating margin	Operating margin change
Shared Medical Syst.	24.7%	$ 41.0	$ 32.9	25.0%	-1.2%
IBM	23.0	7,250.4	5,908.0	23.5	-2.1
Cray Research	22.8	32.3	30.4	30.0	-24.0
Quotron	22.8	27.6	21.1	24.0	-5.0
Tandy	21.5	155.5	110.0	18.7	15.0
Apple Computer	18.1	120.0	74.8	23.9	-24.3
Telex	18.1	35.2	18.4	12.9	40 3
Floating Point Syst.	17.9	15.5	9.4	16.2	10.5
Commodore Int'l.	17.6	74.0	39.5	22.4	-21.4
NBI	17.3	20.7	13.8	18.0	-3.9

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growth over 1981—despite the general economic decline; that growth will no doubt prove to be a powerful magnet to cash-rich corporations without dp subsidiaries. An investment in dp, through acquisition or through internal development, is increasingly an investment with long-term strategic implications. Even companies in totally unrelated industries may be forced to develop some dp-related business as a defensive investment.

The industry with the most overlap with dp—and hence posing the broadest risk of revenue erosion to dp vendors—is clearly telecommunications. Although the unbundled AT&T entity American Bell has not yet developed the revenue base needed for inclusion on the Top 100 list, it is a certainty that Bell and other telephone operations (not all of them U.S.-based) will be offering integrated office systems and enhanced telecommunications services in the near future. Failure to do so exposes these vendors to the risk that IBM, DEC, and the other major dp players with substantial credibility in the office will preempt this market in the future.

Contel is an example of a telecommunications conglomerate we expect to make the Top 100 for 1983; it just missed in 1982. Other players might very well be L.M. Ericcson, the Swedish giant; the Japanese major-leaguers (with NEC closest to the American office market today); and perhaps a government-backed European postal, telegraph, and telephone operation.

Watch, too, for unexpected moves from IBM. On the heels of its overwhelming success with a product aimed partially at the consumer market, the Personal Computer, will IBM feel confident enough to introduce a very low-priced telephone terminal/portable computing device for sale to the true mass market? After all, with 100 million telephone-equipped households in the United

Chart 9

Ranking by 1982 revenues per dp employee

	Dp revenue per dp employee ($000)	Total dp employment	Dp operating profit per dp employee ($000)	Profit per worker rank	1982 dp revenues ($000,000)
1 C. Itoh Electronics	$408.0	800			$ 326.4
2 Lear Siegler	293.3	300			88.0
3 Apple Computer	222.0	2,990	$40.1	4	663.8
4 Systems Industries	130.7	577	3.9	44	75.4
5 Tandy (Radio Shack)	113.3	6,400	24.3	7	725.0
6 NBI	109.1	1,096	18.9	12	119.5
7 CPT	108.8	1,458	17.2	14	158.6
8 Cray Research	104.4	1,352	23.9	8	141.1
9 Quotron Syst.	103.3	1,170	23.6	9	120.9
10 Tandem Computers	100.7	3,286	12.5	21	330.9
11 Gould-SEL	98.5	3,300	7.9	33	325.0
12 Commerce Clearing House	97.3	1,074	1.9	55	104.5
13 IBM	95.9	328,000	22.1	11	31,467.6
14 Floating Point Syst.	91.1	950	16.3	15	86.6
15 Shared Medical Syst.	89.6	1,850	22.2	10	165.8
16 Commodore Int'l.	89.4	4,700	15.7	16	420.0
17 Mgt. Science America	88.0	1,151	10.6	22	101.2
18 Intergraph	86.5	1,800	13.9	18	155.6
19 United Telecomm.	85.8	1,732			148.7
20 Raytheon Data Syst.	84.0	4,000			336.0

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States, each likely to spend $75 on new telephone-terminal gear over the next five years, a 20 percent share of that market is worth $1.5 billion—about what the Personal Computer has garnered to date.

Expect IBM to offer new high-end machines over the next 12 months, as well. The IBM strategy may call for preemptive marketing strikes against Cray and the Japanese "fifth generation," possibly including the positioning of Big Blue's current heavy iron (the 3084 multiprocessor) as a supercomputer. Such a development would be a holding strategy, of course; new generations of thermal-conduction-module-based processors, churned out of IBM's highly efficient production facilities in early 1984, will pose a performance threat to the current supercomputer builders, Control Data and Cray.

The overall situation in dp has not changed since we last commented on the 'MIPS bulge' phenomenon; makers of hardware still depend on clever software designers' cooking up new, friendlier, and less efficient applications—applications that demand computers with higher ratings, in millions of instructions per second, to accomplish each useful task—to generate some major portion of the increasing demand for processing power. The hardware builders, of course, want to see that demand continue to increase, to feed their revenue growth. Applications designers are obliging—from the low end, micro software specialists, up through the high end, natural-language interpre-

Chart 10

Ranking by 1982 dp revenues in the United States

(Dollars in millions)

	U.S. dp revenues 1982	U.S. dp share of total dp revenues 1982	U.S. dp revenues 1981	U.S. dp growth rate '82/'81	Top 100 rank 1982
1 IBM	$16,363.2	52.0%	$13,082.0	25.1%	1
2 DEC	2,411.4	60.0	2,116.1	14.0	2
3 Control Data	2,229.0	67.5	2,108.0	5.7	4
4 Burroughs	1,823.3	47.9	1,650.0	10.5	3
5 Sperry	1,470.0	52.5	1,597.4	-8.0	6
6 NCR	1,410.4	48.4	1,373.0	2.7	5
7 Honeywell	1,224.1	72.6	1,183.0	3.5	8
8 Hewlett-Packard	1,170.7	51.6	917.2	27.6	7
9 Wang Labs.	913.5	69.1	850.0	7.5	9
10 TRW	901.0	94.0	805.0	11.9	12
11 Xerox	893.3	91.6	770.0	16.0	11
12 Storage Technology	765.0	74.3	647.4	18.2	10
13 Texas Instruments	621.3	83.2	512.0	21.4	15
14 General Electric	600.0	70.6	490.0	22.4	13
15 Tandy (Radio Shack)	583.0	80.4	370.0	57.6	16
16 Computer Sciences	562.8	82.4	510.4	10.3	18
17 Data General	538.6	67.0	501.9	7.3	14
18 Electronic Data Syst.	536.0	96.5	461.4	16.2	20
19 Apple Computer	480.4	72.4	290.0	65.7	19
20 McDonnell Douglas	452.2	95.0	264.0	71.3	23
Summary:	$35,949.2		$30,498.8		

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(Continued from page G30)

ters. Videotex applications will also provide vast new markets for processing power, although the commercial nature of these systems is still unsettled.

But the most significant development arising out of this vast diffusion of processing power is still essentially unrecognized. As many MIS/dp executives and professionals realize, control over information and information-processing resources is essentially a political question. The turmoil many MIS/dp managers are experiencing as micro-based workstations and databases proliferate is a small-scale version of what society at large will be facing over the next decade. Cheaper processors and more friendly software mean more users of dp services. Higher 'computer consciousness' throughout organizations means lower tolerance for arcane computerese and system downtime. Greater social awareness of the implications and importance of dp (the Top 100's combined revenues are more than twice the revenues of the entire domestic housing industry, for example) means that questions about privacy, information ownership, and the nature of work itself in the workstation age will move from the realm of the specialist into the broader arena of public consciousness. Information-system executives must keep pace with this revolution or risk increasing isolation and eventual obsolescence. □

> "Companies in totally unrelated industries may be forced to develop dp-related business as a defensive investment."

Gartner Group defines dp revenues as those revenues generated by the sale, lease, or service of dp hardware or software or the provision of a dp service. Revenues are counted for the 12 months ending Dec. 31, 1982. Included are all systems hardware, such as mainframes, minis, micros above the sub-$100 class, word-processing and other office-systems hardware, OEM and end-user peripheral gear, data-communications equipment such as modems and multiplexers, disk and tape media, CAD/CAM systems, software, and maintenance.

Specifically excluded are services related to common-carrier communications, electric and electronic typewriters, electronic cash registers, instrumentation, semiconductors, board-level computers, printed circuit boards, automatic test gear, PABX-type switching equipment, forms, and paper, as well as companies primarily in leasing (to avoid double-counting IBM's revenues), and revenues from retail operations like Computerland.

Gartner Group maintains a data-

(Continued on page G36)

Chart 11

Ranking by 1982 dp revenues from overseas

(Dollars in millions)

	Foreign dp revenues 1982	Foreign dp share of total dp revenues 1982	Foreign dp revenues 1981	Foreign dp growth '82/'81	Top 100 rank 1982
1 IBM	$15,104.4	48.0%	$12,029.0	25.6%	1
2 Burroughs	1,986.2	52.1	1,284.0	54.7	3
3 DEC	1,607.6	40.0	1,470.5	9.3	2
4 NCR	1,504.9	51.6	1,465.0	2.7	5
5 Sperry	1,330.5	47.5	1,183.6	12.4	6
6 Hewlett-Packard	1,097.3	48.4	957.8	14.6	7
7 Control Data	1,072.1	32.5	1,012.4	5.9	4
8 Honeywell	460.9	27.4	591.0	-22.0	8
9 Wang Labs.	408.0	30.9	158.5	157.4	9
10 Data General	265.3	33.0	262.4	1.1	14

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(Continued from page G32)

base of these statistics which is periodically restated; thus, figures reported in 1982's rankings may not agree perfectly with previously published figures. Gartner Group also restates the revenues of vendors which are not on a December fiscal year; in the event a corporation has an unusual fiscal year (ending in November, for example), the four quarters of data ending closest to December are used. Where companies are closely held or are conglomerates, Gartner Group offers its best estimate of the applicable revenues. Vendors that should be included may be missed.

Gartner Group will publish a detailed compilation of these data in a book which should become available in early summer. This volume will contain more than 100 cross-section charts and extensive analysis of the structure of the dp industry by company, product, and financial concept. For a brochure on this reference work, circle No. 798 on the Reader-Service Card at the back of the June issue of Computer Decisions *or contact Malcolm L. Macfarlane, vice president, Gartner Group, 72 Cummings Point Rd., Stamford, CT 06902, (203) 964-0096.*

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Bradford Nat'l.	75
Burroughs	3
Centronics Data Computer	76
Chase Manhattan	85
Cipher Data Prods.	99
C. Itoh Electronics	36
Commerce Clearing House	80
Commodore Int'l.	26
Computer Sciences	18
Computervision	38
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Cray Research	68
Data General	14
Datapoint	21
Dataproducts	41
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Dysan	67
Electronic Data Syst.	20
Floating Point Syst.	91
General Automation	88
General Electric	13
General Instrument	63
Gerber Scientific	78
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Hewlett-Packard	7
Honeywell	8
IBM	1
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Lear Siegler	90
M/A Com	54
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Mohawk Data Sciences	29
Motorola	22
Nashua	95
National Semiconductor	27
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Nixdorf Computer	55
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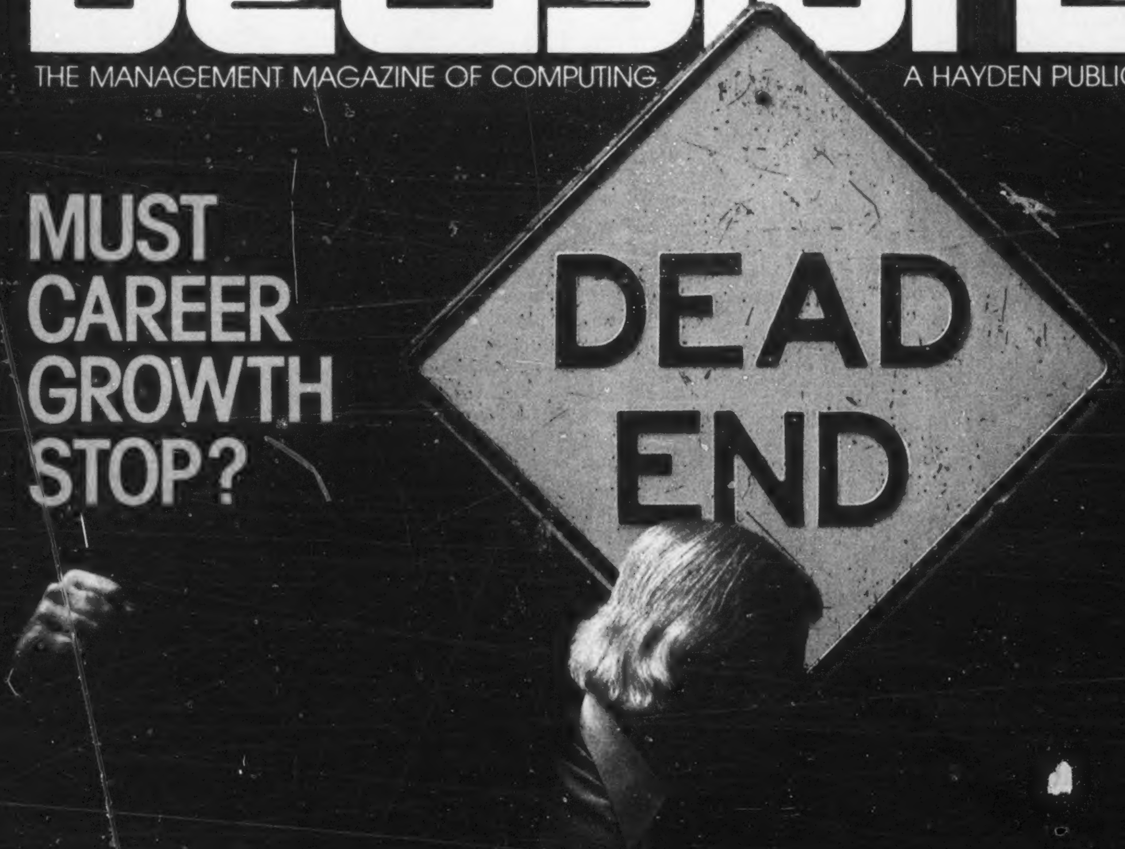
COMPUTER
DECISIONS®
SEPTEMBER 1983
THE MANAGEMENT MAGAZINE OF COMPUTING
A HAYDEN PUBLICATION

MUST CAREER GROWTH STOP?



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The new micro connection

Testing software

Display terminals

Disaster recovery

Cutting costs

COMPUTER DECISIONS

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SEPTEMBER 1983
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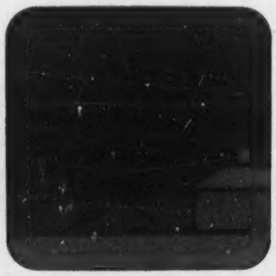

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COVER PHOTO: Ted Hardin

FOLLOWING THE LEADERS

casting and for ordering direct from the factory. That latter responsibility probably could not have been transferred to the field without the multimillion-dollar computerized order-entry system DEC has installed.

Other attempts to automate sales include providing representatives with computerized access to a database that lets them determine the availability of common configurations. Other, "expert," systems help sales representatives configure systems to meet customers' needs.

An important aspect of the reorganization addresses changes in the relationship between DEC's direct sales to end users and sales through third-party distribution channels. DEC had little need for a strong sales force in the past. It could sell everything it made easily. DEC relied on excellent technology at very competitive prices for end-user sales and depended on its unique technical and commercial third-party distribution channels to move many of its products into widely varied markets.

DEC's greater attention to end-user sales, as competition increased in recent years, has led to clashes between the company and third-party vendors. These differences were intensified by the old product-group structure of the company; product groups concentrating on end-user sales often competed head-on with DEC's third-party distributors. With product groups now reduced to strategic functions and with revenue responsibility now dispersed geographically in the sales organization, those rivalries should be mitigated.

Now sales profit centers will be responsible for both direct and third-party sales. Rather than reporting to separate product-group profit centers

Ranking by 1982 dp revenues in the United States *(Dollars in millions)*

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10 Xerox	893.3	91.6	770.0	16.0	11
11 TRW	825.0	100.0	855.0	−3.5	13
12 Storage Technology	765.0	74.3	647.4	18.2	10
13 ADP	641.0	91.1	558.0	14.9	17
14 Texas Instruments	621.3	83.2	512.0	21.4	15
15 General Electric	600.0	70.6	490.0	22.4	12
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18 Data General	538.6	67.0	501.9	7.3	14
19 Electronic Data Syst.	536.0	96.5	461.4	16.2	20
20 Apple Computer	480.4	72.4	290.0	65.7	19
Summary:	$36,062.1		$30,842.8		

Correction: In its compilation of the Top 100 dp vendors (June), Gartner Group inadvertently left Automatic Data Processing (ADP) out of Chart I0, updated here. For a copy of the complete "Top 100 in dp" compilation, send $3 to Computer Decisions, Dept. DP 100, 50 Essex St., Rochelle Park, NJ 07662.

OFFICE AUTOMATION

Do you underestimate your secretary?

Do you believe your secretary is too busy for or incapable of original writing, analyzing, or decision-making? Her (yes, secretaries are almost exclusively female) thoughts may differ. Are you frequently interrupted by unnecessary questions about an assigned task? She might complain you did not explain the assignment properly.

Although automation is heralded as the new key to office productivity, it does not reduce the importance of communication between management and staff. Automation won't improve operations if you and your secretary don't make an effort to understand each other.

Let's take a look at the frequently conflicting ways managers and secretaries view themselves, their work, the office, and automation. The following statistics are based on the results of a nationwide survey sponsored by Honeywell Inc., Minneapolis. The researchers contacted information-intensive businesses with 100 or more employees, and queried 1,264 secretaries and 937 managers. Of these, 909 were secretary/manager teams.

> More than half of the secretaries don't have word processors; 75 percent don't have memory typewriters.

Guess how much time your secretary spends handling your telephone calls, organizing paperwork, and performing other traditional secretarial tasks. If you're like most managers, you probably guessed too high. Although both management and support staff agree that a great deal of a secretary's time is spent handling routine chores, managers are unaware that secretaries actually do spend some time making decisions, dealing with associates, analyzing, and managing others' work.

If your secretary feels qualified to handle some of your more time-consuming responsibilities (supervising small tasks, writing routine letters and memos, making minor decisions, and doing routine data processing), will you let her? Most managers surveyed don't. Even though they consider these chores wasteful of their time and professional expertise, they hesitate to delegate them. Why? Half the managers consider these tasks impossible to delegate; four out of ten believe their secretaries are too busy. Less than one in five rate their secretaries as incapable.

Are they right? Not according to the responses from their secretaries. Less than one in four report being too busy for additional responsibility. Indeed, only one secretary in 20 believes she is performing to the limit of her abilities.

Improving productivity

Managers and secretaries also disagree on how to bolster personal productivity. Four of ten secretaries believe better communication is crucial to a well-run office. Other ways managers can improve secretarial productivity, they say, are to minimize unnecessary interruptions, assign tasks with enough lead time to meet deadlines, explain how each job fits into the big picture, and cut down on changes requiring retyping.

In contrast, managers say their own productivity would rise if secre-

How can managers improve secretaries' productivity?

	Secretaries
Communicate better with me so I can do my job more effectively	**39%**
Minimize unnecessary interruptions	**35**
Assign work with enough time to meet deadlines	**31**
Tell me how my work fits into the project as a whole	**24**
Minimize changes requiring retyping	**22**
Give me enough authority to carry out all my responsibilities	**18**
Keep changes in travel plans, meetings, etc., to a minimum	**14**
Supervise my work only when necessary	**6**
Other	**7**
No improvement needed	**21**
Not sure/no answer	**2**

(Multiple responses)

Sixty-five percent of all the secretaries reported their productivity would improve if managers paid attention to a number of suggestions. The majority seem to believe that communication is the key to productivity.

OFFICE AUTOMATION

taries minimized unnecessary interruptions. Ironically, their second favorite idea is for the secretary to assume additional responsibilities —a suggestion that contradicts their previously mentioned reluctance to delegate. They also consider important a secretary's abilities to work well under pressure and to resolve personal conflicts in the office without management's involvement.

In assessing the productivity of the entire office, secretaries rank smoother workflow as the most necessary improvement, followed by a stronger team relationship with their boss, and fuller use of their abilities.

Managers, on the other hand, equate improved productivity with office automation. Tied for second place are smoother workflow and fuller use of the secretary's abilities. Even though managers seem to concur with secretaries on the last point, they see little need for closer teamwork between bosses and their secretaries. Apparently, they believe one can be achieved without the other.

Managers and secretaries give relatively few suggestions for using automation more effectively. Both agree more intensive training is needed. Fewer than one in ten mention other possibilities, such as more and/or improved equipment. However, a few managers think it advantageous to rearrange access to the equipment. Half the managers and one third of the secretaries have no suggestions for improving the way equipment is used. The only conclusion to be drawn from these responses is that either both groups believe the equipment is working at full productivity or neither is familiar enough with the technology to offer suggestions.

In this supposed age of automation, it's surprising that more than half the secretaries surveyed do not have word processors; three-fourths do not have access to memory typewriters, personal computers, electronic mail, computerized scheduling, or computerized filing. Of the secretaries that do have access, most share the equipment with others or send the work to an automated center. The likelihood of having all kinds of automated equipment varies with the size of the company: The larger the company, the more automation available.

Both the secretaries and managers working in automated offices express an overwhelmingly positive reaction to the equipment. Nine of ten report the equipment speeds routine tasks, improves the quality of work, and frees them for more interesting and challenging activities.

Although both groups' perceptions of the value of automated office equipment are positive, secretarial reactions are even higher than those of management, particularly among the younger age groups (under 25 years) and in highly automated offices. Once acclimated to the equipment, many users express a dependency and feel they could not handle the workload without it.

How can automation productivity be improved?

	Users of automated equipment	
	Secretaries	Managers
More/better training	19%	14%
More equipment	10	8
Better/improved equipment	8	10
Rearranged access to present equipment	8	9
Become more familiar with equipment	4	4
Other suggestions	22	12
Don't know/no answer	35	48

(Multiple responses)

Secretaries and managers agree that training and a sufficient amount of equipment are vital to productivity in the automated office. Surprisingly, secretaries seem to have a better understanding than their managers of office equipment.

Health: Low priority

Concerns expressed by users are that the equipment does not meet current needs, becomes obsolete, is subject to downtime, and, most importantly, does not come with enough training. Health and safety concerns are mentioned by less than 1 percent of those surveyed.

Improvements recommended by the users include more thorough training (highest on the list), more say on choice of equipment and installation, and smoother workflow.

Of the secretaries and managers in non-automated offices, half the managers and more than one-third of the secretaries feel the equipment would be a great help in improving productivity. Only one in ten has a negative reaction to automation. Similar to users in automated offices, positive attitudes are higher among the younger secretaries.

Statistics can be useful, but they can only show where problems lie. The best way to find out if this survey voices your secretary's opinions is to conduct your own survey and ask her. ☐

The survey cited in this column was conducted for Honeywell Inc. in Minneapolis, by Response Analysis Corp., a research house in Princeton, NJ. Results are based on a computer-generated random sample, drawn by Dun & Bradstreet. Four hundred and forty-three companies participated.

Before Disaster Strikes...

The possibilities for disaster in the data center are endless, ranging from tornadoes to tumbling gargoyles. Planning for all of them will help you survive.

by Mary Miles, New England Editor

Everyone hopes to avoid the ugly possibilities for disaster that lurk just a week, a day, a moment away. Like falling gargoyles.

That's what caused a recent disaster in the data center of a major Wisconsin bank. When the gargoyle fell, it ripped a hole in the wall of the data center on the way down. Several valuable pieces of dp equipment were dispatched.

You can't do much about preventing spooky events like diving gargoyles, or even more common events like tornadoes, earthquakes, and floods. Hoping for the best won't do you much good either. However, you can devise a strategy for putting your data center's operations together again in the wake of a calamitous episode that disables your data center. Preparing a plan to deal with disaster is an arduous and expensive task. In the end, however, the plan will give you a better grip on your resources. The confidence that such a plan engenders alone makes it worth the effort.

Preparing for disaster in the data center has never been more important. More and more organizations are computerizing information on vital sales, inventory, marketing, and other operations. A business can't function if its data and facilities are lost—it's that simple. "A disaster-recovery plan is no longer a nicety for business—it's a necessity," declares William Mitchell, manager of systems programming and operations for Melpar Division of E-Systems Inc., a major electronic-warfare contractor headquartered in Dallas. "Management cannot afford to say, 'It'll never happen to me.'"

Preparations for the worst should include copying important data and applications. However, because data-processing is linked to every function of an organization, an effective plan must anticipate a whole range of problems. A plan that includes backup computing facilities but fails to provide for employee relocation is half a plan. Says G.E. Caldwell of New Jersey Bell, Newark: "An incomplete plan is as good as hanging a mustard seed around your neck to ward off disaster. It's amulet security."

Because a disaster-recovery

Before Disaster Strikes . . .

(Continued from page 137)

plan must be so comprehensive, most experts agree planning should be a corporate issue. "Backup and recovery are not simply MIS/dp issues, they're problems for the brass to address," asserts Martin Silverman, of Coopers & Lybrand's Chicago-based information-services consultancy. However, most organizations pass responsibility for disaster planning to MIS/dp. Disaster recovery is related to data security, and that's MIS/dp's responsibility. Many MIS/dp managers complain they are trapped between day-to-day operational requirements and the need for long-range preparations, says Silverman. However, if your company doesn't have plans to respond to a data-center breakdown, you should provide the necessary impetus.

If you don't plan for the unthinkable on your own, the issue—like the potential for disaster—won't go away. You'll find it back at your door. Auditors, insurance carriers, and the federal government have begun to press for better disaster-recovery preparations across the country. For example, one corporation received the following letter from its auditors:

"We note that there is no formal disaster-recovery plan in place. Without such a plan, Laidback Corp. [not the corporation's real name] is exposing itself to unnecessary risk in the event of the unavailability or limited availability of in-house data-processing services.

"We recommend that the company develop a structured disaster-recovery plan. It should address the following topics:

- Levels of response to a number of possible disasters.
- Hardware requirements
- Teleprocessing requirements
- Data-entry support
- Operating-system software and utilities
- Application software
- Data-file storage and retention
- Forms

(Continued on page 142)

Backup sites

Fully equipped IBM sites

Bessemer Information Svcs.
Monroeville, PA
(412) 829-3336
Circle 437

Bradford Nat'l. Computer
Teaneck, NJ
(201) 833-1020
Circle 438

Combac
Mississauga, Ont., Canada
(416) 821-2800
Circle 439

Comdisco
Rosemont, IL
(312) 698-3000
Circle 440

Continental Computer Assurance
Newton, PA
(215) 968-6000
Circle 441

Corporate Contingency Svcs.
New Hudson, MI
(313) 486-2110
Circle 442

Eloigne
Minneapolis
(612) 644-7587
Circle 443

Hotsite
Niles, OH
(216) 652-9624
Circle 444

Neshaminy Valley
St. Trevose, PA
(215) 322-2285
Circle 445

Policy Mgt. Syst.
Columbia, SC
(803) 748-2929
Circle 446

Software Research
Needham Heights, MA
(617) 449-5310
Circle 447

Sungard
Philadelphia
(215) 972-4219
Circle 448

Non-IBM sites

Arbat Syst.
(DEC)
Hoboken, NJ
(201) 963-4440
Circle 449

Cadre
(Burroughs med. syst.)
Avon, CT
(203) 674-1285
Circle 450

Computer Alternatives
(NCR)
Ridgewood, NJ
(201) 652-0400
Circle 451

Disaster Control
(Burroughs)
Doylestown, PA
(215) 355-7800
Circle 452

CRA
(Honeywell)
Phoenix, AZ
(602) 944-1548
Circle 453

Information Network
(DEC, IBM)
Dallas
(214) 630-1240
Circle 454

Phoenix Services
(Prime 750)
Lexington, MA
(617) 863-5040
Circle 455

Remote Computing
(Large Burroughs)
Palo Alto, CA
(213) 386-6430
Circle 456

Empty-shell backup sites

Auto Owners Disaster Recovery Facility
Lansing, MI
(517) 323-1200
Circle 457

Bradford Nat'l. Computer Svcs.
See above
Circle 458

Cadre
See above
Circle 459

Centre de Recuperation d'Informatique
Montreal, Canada
(514) 284-3256
Circle 460

Combac
See above
Circle 461

Corporate Contingency Svcs.
See above
Circle 462

CRA
Phoenix, AZ
(602) 944-1548
Circle 463

DP Security
Fort Worth, TX
(817) 457-9400
Circle 464

DataShield
Greendale, WI
(414) 421-7710
Circle 465

Data-Site
Greenville, RI
(401) 949-1090
Circle 466

Disaster Control
See above
Circle 467

Eloigne
See above
Circle 468

Emergency Computer Ctr.
Lenexa, KS
(913) 888-6200
Circle 469

HSH Cold Site
Columbus, OH
(614) 888-1050
Circle 470

Policy Mgt. Syst.
See above
Circle 471

Remote Computing
See above
Circle 472

Western Southern Life Ins.
Cincinnati, OH
(513) 629-1800
Circle 473

Before Disaster Strikes . . .

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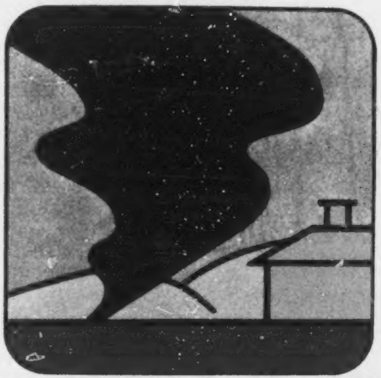
- System-operation procedures
- User procedures
- Staff assignments and responsibilities
- Maintenance of the plan.

"Laidback Corp.'s exposure to risk is not readily evident to users of the systems, but is a subject that the company's and the MIS department's management should address. Note the emphasis on both corporate and MIS management."

Legal liability



Organizations can be held legally culpable for failing to protect all of their assets—and data-processing resources are certainly key assets in most companies. One New York bank was held liable for checks dishonored by other banks during an "emergency" in its data center. The other banks sued, claiming that emergency or no emergency, the bank hadn't outlined sufficient contingencies for its automated systems. The judge in the case agreed with the plaintiff banks.

Just last May, Controller of the Currency C.T. Conover warned banks that their preparations for dp disasters would become part of federal bank examinations. General accounting standards demand that banks prepare for disaster, he wrote. According to a letter by Conover distributed to banks, disaster-recovery plans should be reviewed annually by the board of directors.

Some experts predict the federal

Power conditioners and monitors

Conditioners

Abacus Controls	(201) 526-6010	Circle 474
Acme Electric	(919) 738-1121	Circle 475
Amtek Syst.	(214) 238-5300	Circle 476
Atlas Energy Syst.	(213) 575-0755	Circle 477
Behlman Engineering	(805) 684-8311	Circle 478
Best Energy Syst.	(608) 565-7200	Circle 479
Clary	(213) 287-6111	Circle 480
Computer Power	(201) 735-8000	Circle 481
Computer Power Products	(213) 323-4181	Circle 482
Computer Power Syst.	(213) 515-6566	Circle 483
Cuesta Syst.	(805) 541-4160	Circle 484
Cyberex	(216) 946-1783	Circle 485
Deltec	(619) 291-4211	Circle 486
Electronic Specialists	(617) 655-1532	Circle 487
Elgar	(619) 565-1155	Circle 488
Emergency Power Engineering	(714) 557-1636	Circle 489
Emerson Electric	(714) 545-5581	Circle 490
Exide Electronics	(919) 872-3020	Circle 491
General Electric	(615) 824-7260	Circle 492
Georator	(703) 368-2101	Circle 493
Gould	(619) 291-4211	Circle 494
Int'l. Power Machines	(214) 288-7501	Circle 495
ITT Power Syst.	(419) 468-8100	Circle 496
Kalglo Electronics	(215) 837-0700	Circle 497
K/W Control Syst.	(914) 355-6741	Circle 498
LEA	(213) 944-0916	Circle 499
Liebert	(614) 888-0246	Circle 500
Litton Industrial Products	(414) 481-6000	Circle 501
Lortec Power Syst.	(216) 327-5050	Circle 502
Micron Industrial	(312) 345-0788	Circle 503
Nova Electric Mfg.	(201) 661-3434	Circle 504
Pilgrim Electric	(516) 420-8989	Circle 505
Power Conversion Products	(815) 459-9100	Circle 506
Powermark	(619) 565-8363	Circle 671
Power-Matic	(619) 292-4422	Circle 507
Power Syst. & Controls	(804) 355-2803	Circle 508
Ratelco	(206) 624-7770	Circle 509
RKS Industries	(408) 438-5760	Circle 669
Russelectric	617) 749-6000	Circle 510
Shape Magnetronics	(312) 620-8394	Circle 511
Sola Electric	(312) 439-2800	Circle 512
Solidstate Controls	(614) 846-7500	Circle 513
Teledyne Inet	(213) 325-5040	Circle 514
TII Industries	(516) 789-5000	Circle 515
Topaz Electronics	(619) 279-0831	Circle 516
UPSystems	(213) 634-0621	Circle 517
Welco Industries	(513) 891-6600	Circle 518

Monitors

Billings McEachern	(415) 570-5355	Circle 519
Champion Industrial Products	(516) 482-2280	Circle 520
Consultronics	(201) 672-8278	Circle 521
Dranetz Engineering Labs	(201) 287-3680	Circle 522
Liebert	See above	Circle 523
Power-Science	(619) 292-4322	Circle 524
RKS Industries	See above	Circle 670

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call for disaster preparation won't stop with banks. "If the feds are going to do that for banks, other regulatory bodies are bound to take similar action," says Norman Harris, president of HSH National Management Inc., a Columbus, OH, disaster-recovery consultancy. Likely targets include insurance carriers, utilities, and other government agencies, he says.

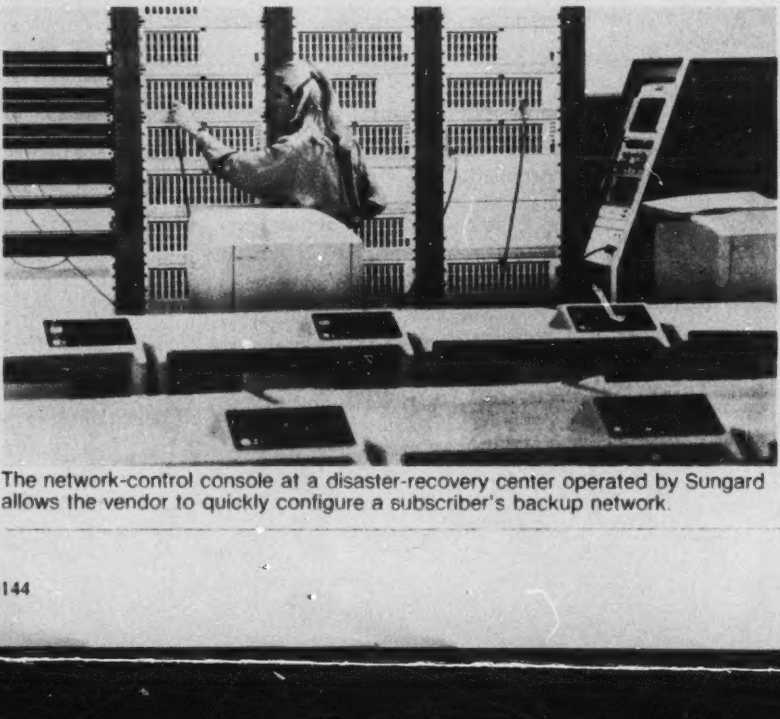
Two strategies

Ever so slowly, companies are recognizing the need to think about how they will recover from a disaster. Unfortunately, that doesn't mean they're responding with well-conceived preparations. Companies embrace one of two strategies, says Gerald Isaacson, director of the Computer Security Institute Educational Resource Center, Northboro, MA.

Backup tapes should be stored in a secure place. Here, subscriber tapes are stored in an underground vault operated by Dataguard Inc.

"A lot of managers do only the minimum required to satisfy an auditor," Isaacson says. This strategy fits Caldwell's definition of amulet security. In many cases, these managers are reluctant to commit precious financial resources to long-range contingency planning, says Isaacson. Faced with the choice between an expensive plan and an expensive computer, they opt for the computer. "You can sit around predicting doom all you want," says the manager of a dp center unnervingly near the epicenter of last May's earthquake near Coalinga, CA. "But we've got too much applications development to complete to worry about something that may or may not happen." That manager's decision might be understandable, but it also could have disastrous consequences.

Managers who adopt the second strategy outlined by Isaacson perceive disaster preparation as a necessary business expense, much like liability insurance. These companies commit themselves to the difficult task of completing a disaster-recovery plan. "They say, 'We have to define the impact of losing our data-processing facility for an extended period,'" says Isaacson. These managers realize that even if a shutdown doesn't put their organizations out of business, profits will plummet and business will be lost to competitors.



The network-control console at a disaster-recovery center operated by Sungard allows the vendor to quickly configure a subscriber's backup network.

Isaacson believes most of corporate America is relying on amulet plans. In a recent seminar on disaster recovery, Isaacson asked how many participants had working disaster-recovery plans. Five of the 50 participants raised their hands. About the same percentage of corporate citizens have comprehensive plans for disaster, he says. "Planning for disaster recovery is like buying cemetery plots," says Isaacson. "Most people don't buy a gravesite until the end of their lives — when they realize they're going to die."

Perhaps the best-prepared organizations are the ones that have lived through a calamity. William Mitchell formulated a solid plan after a data-center fire revealed the inadequacies of E-Systems' preparations for disaster. "I was lucky," he says. "We didn't lose much equipment."

THE PERILS

The perils that can befall your data center could fill a thick book. There are all sorts of oddball events, like the plummeting gargoyle. The data center at Mazda Motors of America Inc., Compton, CA, was devastated when a rain-soaked roof collapsed. A blackout in Boston's financial district became a 28-hour nightmare for some dp operations. You might fall victim to an earthquake or in some other way be struck down by an act of God. Even an employee oversight or error may trigger a disabling event.

Nine out of 10 dp disasters are caused by fire, says Irving J. Chasen, manager of management-consulting

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services for Coopers & Lybrand, Philadelphia. The majority of computer fires are caused by short circuits in hardware components, he says.

The good news about fires is that there are lots of time-tested precautions that can mitigate their impact. If your organization doesn't have fire alarms, sensors, and detectors, it should. You should also assess which fire-extinguishing method is best for your organization. Will water cause more damage to equipment than halogen, a gas used to smother fires? Finally, you'll need formal procedures to protect employees, data, software, and hardware in case of fire.

Power problems fall into the same

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Other pertinent services

Air conditioners, cleaners, humidifiers

AC Mfg.
(609) 428-9800
Circle 525

Airflow
(301) 948-5000
Circle 526

Armstrong Machine Works
(616) 273-1415
Circle 527

Carnes
(608) 845-6411
Circle 528

Data Aire
(714) 891-3471
Circle 529

Hiross
(716) 283-6464
Circle 530

Liebert
See above
Circle 531

Research Products
(608) 257-8801
Circle 532

United Air Specialists
(513) 891-0400
Circle 533

Fireproof vaults, filing cabinets

John D. Brush
(716) 381-4900
Circle 534

Datasafe
(404) 256-5775
Circle 535

Diebold
(216) 489-4000
Circle 536

Guardian Safe Depository
(201) 796-9191
Circle 537

Meilink Steel Safe
(212) 684-4750
Circle 538

Metropolitan Business Syst.
(212) 760-1600
Circle 539

Mosler Safe
(212) 840-5482
Circle 540

Oxford Pendaflex
(516) 741-3200
Circle 541

Schwab Safe
(317) 447-9470
Circle 542

Supreme Equipment & Syst.
(212) 492-7777
Circle 543

Victor Syst. & Equipment
(614) 374-9300
Circle 544

Wright Line
(617) 852-4300
Circle 545

Security lockers

American Locker Security Systems
(716) 664-9600
Circle 546

Security-access systems

Amcard Syst.
(617) 562-7111
Circle 556

Analytics
(703) 893-2124
Circle 557

Butler National
(913) 888-8585
Circle 558

Cardkey Syst.
(213) 998-2777
Circle 559

Datakey
(612) 890-6850
Circle 560

Emidata Syst.
(301) 363-1600
Circle 561

Fingermatrix
(914) 428-5441
Circle 562

Graphic Laminating
(216) 881-2100
Circle 563

Honeywell
(612) 332-5200
Circle 564

Identatronics
(312) 437-2654
Circle 565

Int'l. Mobile Machines
(215) 569-3880
Circle 566

Laminex
(704) 588-4700
Circle 567

Mastiff Syst.
(404) 448-4100
Circle 568

Medeco Security Locks
(703) 387-0481
Circle 569

Palmguard
(503) 644-3235
Circle 570

Rusco Electronics
(213) 240-2540
Circle 571

Schlage Electronics
(408) 727-5170
Circle 572

Sensormatic Electronics
(305) 427-9700
Circle 573

Sielox Syst.
(408) 255-1490
Circle 574

Simplex Security Syst.
(203) 693-8391
Circle 575

Stellar Syst.
(408) 946-6460
Circle 576

Sutton Designs
(607) 277-4301
Circle 577

Sycon
(408) 374-3049
Circle 578

Synergistics
(617) 655-1340
Circle 579

Systematics
(213) 799-6696
Circle 580

TEC
(602) 792-2230
Circle 581

TelTech
(212) 921-0250
Circle 582

Records managment, storage

American Safety Deposit
(704) 377-9615
Circle 583

Bekins Records Mgt.
(213) 466-9271
Circle 584

Dataguard
(201) 592-7868
Circle 585

Dataguard
(617) 875-4300
Circle 586

Data Security
(206) 581-4200
Circle 587

Datavault
(617) 444-8908
Circle 588

Fort Knox Safe Depository
(404) 457-1005
Circle 589

Keep-Safe
(415) 326-7290
Circle 590

Off-Site Storage
(617) 454-8033
Circle 591

Perpetual Storage
(801) 942-1950
Circle 592

Vital Records
(201) 526-7557
Circle 593

Protective terminal covers

Compucover
(904) 243-5793
Circle 594

Computer Accessories
(516) 767-0366
Circle 595

Computer Coverup
(312) 520-3350
Circle 596

Coverguard
(201) 522-0044
Circle 597

Terminal anchors

Anchor Pad Int'l.
(213) 306-3881
Circle 598

Before Disaster Strikes . . .

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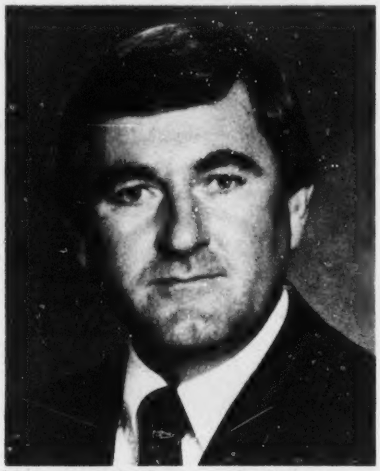
category as fires—simply because you can take effective precautionary steps against them. A number of devices will protect your power supplies from brownouts, blackouts, and surges. You may also benefit from an uninterruptible power system or motor-generator.

Human disasters

After fire, the most common dp disasters are the handiwork of humans and tornadoes, earthquakes, floods, mudslides, and other natural events.

Human-related episodes include crimes such as fraud, vandalism, and arson; work stoppages or strikes; civil disturbances; malicious sabotage; and simple oversights and errors. Human error is perhaps the most common of these, says Bernard S. Balter of Dataguard, a data-storage facility in Fort Lee, NJ. "Managers must make provisions for the mistakes and accidents that can occur every day in dp," he says. "A console operator, for example, can inadvertently wipe out an entire operating system."

Some seemingly small mistakes can have disastrous consequences, says Isaacson. A disk pack that is dropped on the floor can throw a drive's heads out of whack. Misaligned heads not only won't read data, they'll also damage other disk packs. In several companies, dropped disk packs have touched off a chain of events that ruined several disks and the data they held, says Isaacson.



Many organizations overlook the "pockets of information" contained in their microcomputers when planning for a disaster, says Norman Harris of HSH National Management Inc.

"Omissions and errors by honest, well-intentioned employees are a primary problem," says New Jersey Bell's Caldwell. "And the primary culprits in lost computer time are poor training, incompetence, improper documentation, lack of awareness about security, and mismanagement."

What hath God wrought?

Natural disasters cause only a small percentage of computer disasters. Even so, they get a lot of attention. After all, natural disasters are dramatic.

Two consultants at Dames & Moore, a Los Angeles-based environmental-engineering consultancy, documented the effects on dp establishments of three major earthquakes during the last decade. In their report, "Mitigation of Earthquake Effects on Data Processing Equipment," William Gates and Charles Scawthorn note that the quakes in San Fernando (1971), the Imperial Valley (1979), and Livermore (1980) caused extensive damage.

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Other pertinent services

Static prevention

ACL	(312) 981-9212	Circle 599
Akro	(216) 456-4543	Circle 600
Computerware	(612) 430-2060	Circle 601
Falcon Safety Products	(201) 233-5000	Circle 602
Kendall Plastics	(219) 347-5235	Circle 603
Ludlow Composites	(419) 332-5531	Circle 604
Solder Absorbing Tech.	(413) 788-6191	Circle 605
Tech Spray	(806) 372-8523	Circle 606
Tenex	(312) 439-4020	Circle 607
3M	(612) 733-8254	Circle 608
United Technical Products	(617) 326-7611	Circle 609

Data transportation

Airborne Freight	(206) 285-4600	Circle 651
Mayflower Electronics	(408) 263-9301	Circle 652

Data protection, recovery

Data Devices Int'l.	(213) 998-2900	Circle 653
Randomex Data Maintenance	(213) 595-8301	Circle 654
Taylor Electric	(414) 241-4321	Circle 655

Fire-suppression systems

Ansul	(201) 522-0130	Circle 547
Automatic Sprinkler	(216) 526-9900	Circle 548
Chemetron Fire Syst.	(312) 534-1000	Circle 549
Fike Metal Products	(816) 229-3405	Circle 550
Great Lakes Chemical	(317) 463-2511	Circle 551
Walter Kidde	(201) 241-2950	Circle 552
Pyrotronics	(201) 267-1300	Circle 553

Fire-detection devices

Digital Pathways	(415) 493-5544	Circle 554
Fenwal	(617) 881-2000	Circle 555

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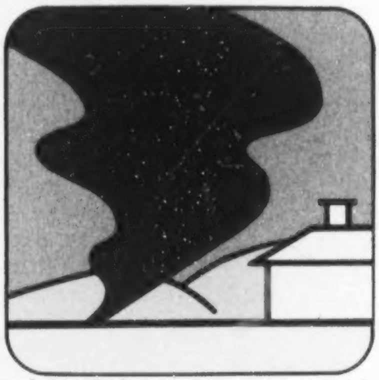
Tape-storage libraries and the tall cabinets typically used to house communications hardware often tipped over during those quakes, Gates and Scawthorn report. Mainframes slid, cabinets warped, subfloor bracing ruptured, and at least three raised floors collapsed. Power failures occurred during each quake. Computer shutdowns ranged from six to 12 hours in the Livermore tremor to several weeks in the San Fernando quake, Gates and Scawthorn report. And the costs of recovery ranged from 50 cents to $2 *per square foot of floor space*.

Gates and Scawthorn encourage organizations in regions vulnerable to earthquakes to install braces and floor anchors to mitigate the effects of tremors and quakes.



For firms located in quake-prone regions, an offsite backup facility and reciprocal site-use agreements with nearby users are prudent measures indeed. Even the Coalinga-area manager who was skeptical about investing in disaster-recovery plans had taken these precautionary steps.

Earthquakes and other disasters that affect wide areas raise another, potentially ugly problem. If an earthquake disables five companies that have contracts with the same backup site, and the backup vendor has enough capacity for only three of them, what happens? Which subscribers get priority? No vendor has answered this question satisfactorily. However, if you contract with a backup site, press for a clear definition of service during a huge disaster.

THE POSSIBILITIES

Before an organization formulates its grand plan to deal with disaster, it must implement several essentially technical measures designed to protect the data center. These include arrangements to duplicate, or back up, data, applications, and processing facilities. Many companies also arrange to have a "hot" backup site, which is fully equipped with stand-in

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Education and consultation

Advanced Information Mgt.	(703) 643-1002	Circle 610
American Society for Industrial Security	(703) 522-5800	Circle 611
Arthur Andersen	(312) 580-0033	Circle 612
Auerbach Publishers	(609) 662-2070	Circle 613
Automation Training Ctr.	(703) 471-5751	Circle 614
Bank Administration Inst.	(312) 228-6200	Circle 615
Bradford Nat'l. Computer Svcs.	(201) 833-1020	Circle 616
Bureau of Nat'l. Affairs	(202) 452-4420	Circle 617
CHI/COR Information Mgt.	(312) 454-9670	Circle 618
Combac	(416) 821-2800	Circle 619
Comdisco	(312) 698-3000	Circle 620
Computer Environments	(201) 242-4321	Circle 621
Computer Protection Syst.	(313) 459-8787	Circle 622
Computer Security Inst.	(617) 845-5050	Circle 623
Coopers & Lybrand	(312) 559-5500	Circle 624
CRC Syst.	(703) 385-0440	Circle 625
Data Processing Security	(817) 457-9400	Circle 626
Data Security Workshops	(516) 499-1616	Circle 627
Devlin Assoc.	(215) 337-1667	Circle 628
DP Facilities	(212) 674-8600	Circle 629
EDP Auditors	(305) 628-5515	Circle 630
EDP Security	(617) 890-6666	Circle 631
Emergency Computer Ctr.	(913) 888-6200	Circle 632
HSH Nat'l. Mgt.	(614) 888-1050	Circle 633
Heinlein Assoc.	(415) 453-2936	Circle 634
IBM Information Syst. Mgt. Inst.	(312) 245-4050	Circle 635
Information Syst. Resources	(612) 452-7913	Circle 636
Information Network	(214) 630-1240	Circle 637
Int'l. Assn. for Computer Syst. Security	(516) 499-1616	Circle 638
Mgt. Advisory Svcs. & Publications	(617) 235-2895	Circle 639
Mgt. Data Syst.	(703) 893-4820	Circle 640
Mgt. Dimensions	(714) 623-3569	Circle 641
Kenneth Meyers	(412) 766-7919	Circle 642
Peat, Marwick, & Mitchell	(612) 341-2222	Circle 643
Policy Mgt. Syst.	(803) 748-2929	Circle 644
Price Waterhouse Mgt. Advisory Svcs.	(412) 355-6000	Circle 645
Renaissance Concept	(804) 262-5403	Circle 646
Security Letter	(212) 348-1553	Circle 647
Sungard	(215) 972-4219	Circle 648
Total Assets Protection	(817) 261-2556	Circle 649
Walter E. Ulrich	713) 666-5433	Circle 650

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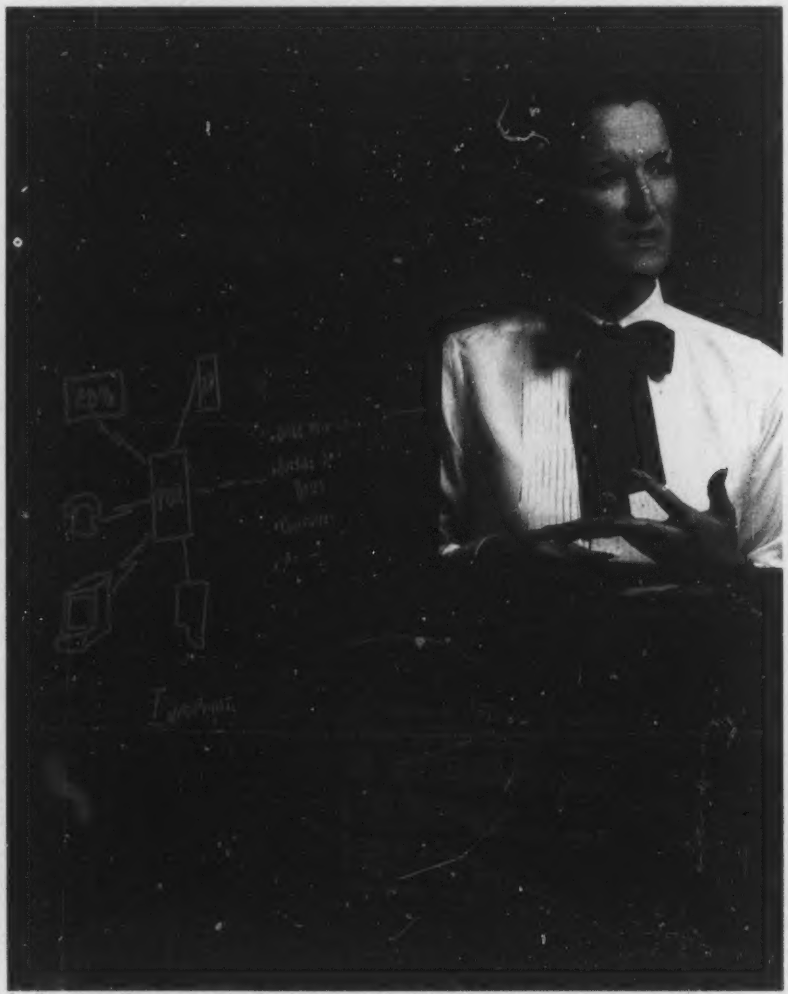
computing facilities, ready and waiting.

These are fairly straightforward tasks. But don't take anything for granted. You have to think of everything that might go wrong. One MIS/dp manager, for example, provided for data and applications backup, but forgot to duplicate his organization's specially modified operating system.

Backup sites

Backup sites, particularly hot sites, are the cornerstone of most disaster-recovery plans. IBM users have a distinct advantage when choosing hot sites, simply because many of them have Big Blue's equipment. Philadelphia-based Sungard recently opened a new center in Chicago for users of medium-sized IBM computers. "We installed IBM 3081s in our locations that already had 3080s," says John H. Ratliff, vice president of marketing. "The advantage is that companies can grow with us. Also, we'll be offering conversion testing of IBM's new MVS/XA operating system this year."

Non-IBM data centers have much more limited facilities at their disposal. Your organization may, for example, be the only user of its hardware for miles and miles. Hasco International (St. Charles, MO), a privately held vendor of hospital photographic systems, faces this situation, says Marc Arnold, MIS director. Hasco has the only Basic Four System 810 in town, and every function of the company depends on it. "We're highly vulnerable to a disaster," he concedes. "We have a two-pronged problem. There's less equipment and expertise out there, but we really have a lot more eggs in one basket than the typical mainframe, batch-oriented user."



A disaster affects your entire business, not just the data center, says Eleanor Luce, MIS director at Olin Corp. Disaster-recovery plans should anticipate every possible problem.

Arnold's awareness of Hasco's Achilles heel was heightened during a recent disaster-recovery seminar. After the seminar, Hasco's management dramatically increased the company's business-interruption insurance, says Arnold. A safety committee was formed to deal with employee safety during a disaster. Hasco was already storing data offsite, but Arnold also began trying to convince Basic Four to upgrade its branch office facilities to full-blown configurations that could function as hot sites. Despite these efforts, however, Arnold estimates that Hasco could be without computing facilities for up to two weeks if disaster strikes.

The standards problem

All hot sites are not created equal. When you go looking for one, beware of potential pitfalls. Above all, make sure you are dealing with a reputable vendor. Many experts bemoan the lack of independent standards in the industry. But standards simply don't exist: It's a jungle out there. John Butch, manager of Hotsite, Niles OH, recommends the following precautions.

- Only consider sites dedicated to disaster recovery. Some sites supply other services, and this practice may affect their availability when you need them.
- Find out if a potential site has been evaluated by an independent third party, like an accounting firm, an insurance carrier, or a disaster-recovery consultancy.
- A site should provide onsite com-

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munications, software, and hardware support.

- Make sure you get adequate test time.
- Does your hot site provide you with backup office space? If not, where are you planning to set up shop in the event of a calamity?
- Will your site provide backup telecommunications capabilities?

Future wave

Communications satellites are nothing new, but they're generating a lot of interest as the components of the future in disaster recovery. "With high transmission capacity and broadcast capabilities, satellites can be an effective tool in a company's backup and recovery system," says Frank Rogers, communications consultant for Metropolitan Life Insurance Co., New York. The insurance carrier deploys satellites in its disaster-recovery network. More conventional communications technologies would cost $1.4 billion more than the satellite system over the next three years, says Rogers.

Satellites can serve a number of functions in a disaster-recovery plan, says Rogers. First, data can be transmitted routinely to backup sites. Second, the backup facility can be dedicated to development work. Development files can be shipped back and forth as needed. If the main facility becomes inoperative, the development center can take over as a full-fledged backup site. Lastly, satellites can be used to move copies of files from backup sites to storage sites. This arrangement adds another layer of protection to the backup-site strategy.

Despite the promise of satellites, Sungard's Ratliff cautions against making a commitment to the technology. Satellites are primarily used for voice communications, and most plans for disaster are primarily concerned with data, he notes. Also, standards don't exist. If you have an RCA-supplied satellite and your backup site uses Comsat or another vendor, there's a compatibility problem, he says.

Ultimately, satellites will be components in the equivalent of value-added networks, Ratliff believes. The first of these networks is taking shape right now. Comdisco Recovery Services, Rosemont, IL, and EMX Telecom, are developing a nationwide data-recovery standby network called CDRS/SN, says Raymond Hipp, Comdisco's president. (EMX Telecom is a partnership between Mitel Inc., Kanata, Ontario, Canada, and American Satellite, Rockville, MD.

The CDRS/SN network will be built around five major hot sites and regional sites for simple storage, or shells. The backup sites will be linked by Comline 3, an enhanced flexible-switching package, and the satellite services. CDRS/SN will handle voice and data communications. "Our concept is to set up a a network of hubs and spokes" says Hipp.

When it is functional—probably during the second half of next year—CDRS/SN will instantly reestablish a client's voice and data lines by shifting them to one of the hot sites. After this remote connection has been established, the client's workstation configuration will be reconstructed within one of the shells. CDRS/SN also will duplicate a client's processing equipment at the shell. "The company will be able to get back home and take control of its employees and data in a very short time," says Hipp.

What about those micros?

Disaster-recovery plans for mainframe centers are a priority for very good reasons, but what about all those minis and micros popping up in offices? "The little machines are creating pockets of information that might be lost without proper planning and emergency preparedness," says HSH's Norman Harris.

"This is disaster-recovery on a different scale," adds Isaacson, of Computer Security Institute. "Micros present all the security and recovery problems of major data centers, only in miniature." Micros generally don't run round the clock, like mainframes, but they pose unique logistical problems. Imagine copying a thousand floppy disks a day. Even more importantly, some companies have invested in proprietary micro software

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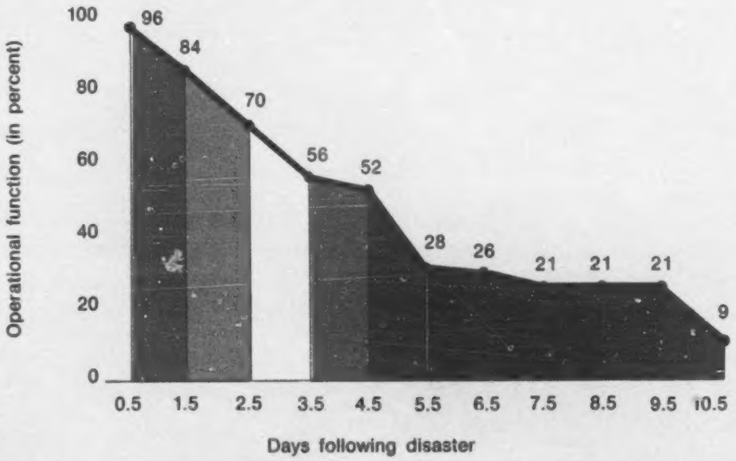
A disaster's impact



If you get caught unprepared, a data-processing disaster's impact on your organization's business functions will worsen with each passing day. The chart was prepared by Masstor Systems Corp.

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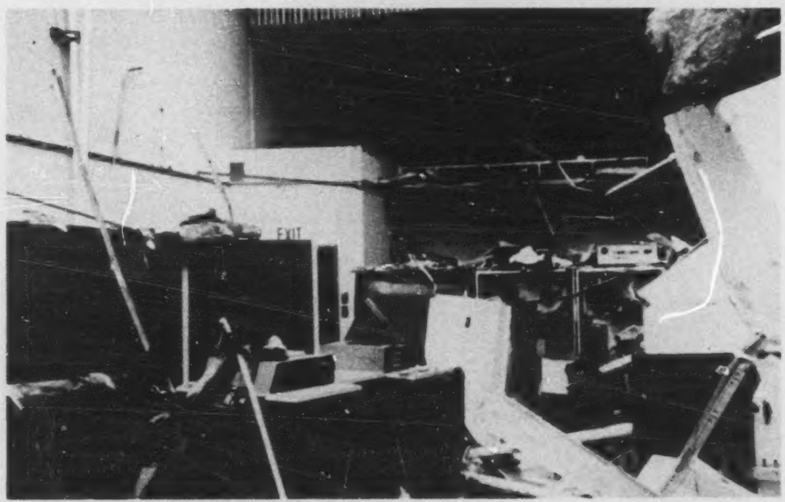
that is vulnerable in an emergency.

Isaacson recommends that micros be connected to mainframes when possible. Backing up files then becomes a matter of downloading floppies onto the mainframe. Downloaded micro files can be included with the day's mainframe backup. Barring that kind of convenient solution, organizations should faithfully back up their micro files, he says.

During the catastrophic fire at the MGM Grand Hotel in Las Vegas, NV, in 1981, the hotel's computer fell through three floors. The backup tapes were in the same building, and they were damaged by smoke and heat. However, MGM Grand recovered 90 percent of its data after the fire.

How? Randomex Data Maintenance Inc., Signal Hill, CA, reconditioned the backup tapes. Randomex was able to perform this operation because MGM had properly cared for the tapes, says Joseph Ludka II, vice president of the vendor. "If you have no data as a result of a disaster, there's no point to having a recovery site," he says. "Backup and proper maintenance of disks are essential."

The telephone-switching equipment in Sylmar, CA, was devastated by the San Fernando earthquake of 1971. It was two months before the switching station was reassembled.



Winter rain storms caused the collapse of the roof over the data center at Mazda Motors Corp. of America, Compton, CA. Fortunately, all data had been backed up.

John Taylor of Taylor Electric Co. (Milwaukee), a data-recovery specialist, advises companies not to factor advanced recovery techniques into disaster-recovery plans. "Don't put yourself in the position where you must recover a damaged disk," he says. Back up material and keep it in a safe place.

New wrinkles in insurance

Insurance is perhaps the oldest idea in disaster planning. Companies have been buying MIS/dp insurance, including coverage for unauthorized computer access, electronic errors, and business interruptions, for years. But only recently have carriers begun to give companies with good disaster-recovery plans a break.

The typical computer policy covers hardware, software, data, media, relocation and other extra expenses, and business interruption, says Marr T. Haack, regional manager of the Inland Marine Commercial Property Insurance Co., St. Paul, MN. More and more, when a carrier considers a policy, it looks at an organization's plans for disaster, he says. "As underwriters, we're looking for prudent concern by top management," he says. "If the concern is there and the disaster-recovery plan looks as if it will work, we'll sometimes reduce our rates."

Like precautions against fire, security might be classified as a disaster-prevention strategy, as opposed to one for disaster recovery. Barring unauthorized accessing of files and use of applications may prevent inadvertent errors. It should also shut out thieves and hackers. A number of vendors offer software packages that monitor and control use of systems. (See Snyders on Software in this issue.)

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Subscribers to Comdisco Disaster Recovery Services can test their systems on the IBM computers at the vendor's sites.

LeeMAH, San Francisco, offers Secure Access Unit (SAU), a device that automatically answers all incoming calls to the information system. It provides callback access only to those who enter the correct security codes from authorized locations. If the caller fails to transmit a valid code, SAU automatically terminates the call.

LeeMAH's product contains a directory of codes and location identifications. The vendor claims SAU is more effective than software passwords, and at $795, it costs less than encryption systems.

Three telephone companies are currently using SAU. The device, which is installed between modem and telephone lines, can monitor 16 locations. It can be expanded to cover up to 64 locations.

THE PLAN

Backup sites, insurance, and the like are important components. But what else should an organization include in a good disaster-recovery plan? There are no pat answers to that question. "You've got to have a sense of what's critical to your business, says Eleanor Luce, MIS director for Olin Corp., Stamford, CT. "The major flaw I find in disaster-recovery plans is that they assume that if the disaster occurs in the computer room, everything else will stay the same. That isn't the way it usually happens."

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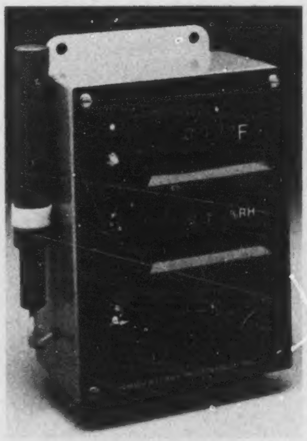

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CIRCLE 92

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You must try to anticipate *everything* when planning responses to disasters. How will each employee continue to function? How will you restore communications? Should you notify customers? What are your vendors' responsibilities? Luce learned about disaster-recovery plans during a fire at Olin two years ago.

The fire in Olin's general offices damaged the data center only indirectly; smoke and soot seeped in and contaminated equipment. However, Olin suffered other incapacitating problems. The water that extinguished the blaze incapacitated the switch that controlled the company's telephone network. Moreover, the lines connecting the customer-service department to the data center ran through the section of the building that burned.

Luckily, the fire occurred on a Saturday, and Olin's data center and related facilities were up and running about 36 hours later. Nevertheless, Luce says the company learned a hard lesson. The corporation wasn't prepared. "We'd just completed a 100-page manual on how to formulate a disaster-recovery plan, but we didn't have a real plan," she says. "We never looked at the manual during the fire."

Today, Olin data is backed up at a Sungard site, and each of its locations has a plan designed to serve *all* departments. Although Luce believes no plan will ever provide solutions to all the problems in a disaster, she endorses the concept. "Building a plan will make you aware of a lot of important factors," she says. "No plan can give you all the answers, but planning will make you aware of where problems might lie."

Amulet security: A plan that provides for backup, but fails to address the range of other problems a disaster causes.

Some corporations aren't as lucky as Olin. The disasters they suffer are crippling. In those cases, a comprehensive plan means the difference between a protracted recovery and a timely one. Banco Mortgage Co., a unit of Northwest Bancorp (Minneapolis), lost a 27-processor network (worth about $500,000) and 4,000 loan files in a major high-rise fire last Thanksgiving. Thanks to the company's full contingency plans, including backed-up software and files and well-defined vendor responsibilities, Banco was able to relocate and restore full operations within four days.

The 1971 San Fernando, CA, earthquake shook this transformer off of its concrete base. The event prompted officials to redesign future installations.

Selling the brass

The toughest aspect of preparing a disaster-recovery plan can be convincing the boss that it's necessary. You don't want to sound like Chicken Little, but at the same time, you'll need a compelling argument.

Your first move should be to debunk two common misconceptions about disaster recovery. First, many executives believe recovery facilities must duplicate the data center. However, only 25 percent of a business' functions are critical to its operation, Coopers & Lybrand's Martin Silverman asserts. If your organization has a $2 million site, it will need one worth about $500,000 in the wake of a disaster. "You don't need a backup site that mirrors what you have," he says. "Look for a configuration that will enable you to process only critical programs, files, and databases."

While your organization limps along at one-quarter speed, it can continue to collect data for the less-critical applications, says Silverman. Collecting this information will enable you to hit the ground running when your facilities are fully restored.

The second misconception is the Myth of the Black Box. Many executives believe a piece of hardware can take care of disaster recovery. "Executives sometimes believe a disaster-recovery plan is a mythical black box that will provide instant recovery from total disaster," asserts Stanley Friedman of Price Waterhouse, New York. Of course, no such black boxes exist.

Having disposed of these misconceptions, you'll be ready to present disaster recovery to the brass as a logical, evolutionary process. Breaking the process into four stages will help, says Silverman. Make it clear that your plan won't require heavy outlays of cash and time—at least in the beginning.

In the first stage, critical applications and resources are identified and risks are assessed. Top management

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must be involved during this stage, says Silverman. During Stage II, lists of the tasks that must be executed to complete the plan are prepared, and individual responsibilities are outlined.

During Phase III, the plan is set down in writing, subject to the results of Phase IV, during which the plan is tested. Without testing, a disaster-recovery plan isn't worth the paper it's written on.

Window on management

Constructing a plan can occupy from six months to two years, and consume considerable resources. "Obviously, there must be a commitment at the top levels of an organization," says Normand Richard of Cadre, an Avon, CT, backup site. "If you have to set fire to the CEO's wastebasket to get his or her attention, do it."

Those who have lived through disasters agree with Olin's Luce that planning is well worth the effort. But many also say disaster planning improves an organization's understanding of itself.

The soul-searching necessary to put together a disaster-recovery plan made Ohio Medical Indemnity a better organization, says Thomas Gruss, MIS assistant vice president.

Says Thomas Gruss, assistant vice president of MIS at Ohio Medical Indemnity Mutual Corp., Worthington, OH: "When we put our plan together, after trying since 1971, we finally got a handle on the details of hardware, software, contracts, budgets, and the like. But preparing a plan also opened up new avenues of communications with our computer vendors and our sister Blue Cross/Blue Shield plans around the country."

In addition, Ohio Medical Indemnity's ability to plan improved as a result of the experience, says Gruss. Equipment backup and a whole host of procedures were standardized, and the carrier compiled its first complete inventory of datasets.

Ultimately, the soul-searching that lead to Ohio Medical Indemnity's disaster-recovery plan made the carrier a better organization. "Even if we never use the plan, it's been like an audit of all our internal functions," says Gruss. "It's truly been a growth experience." ☐

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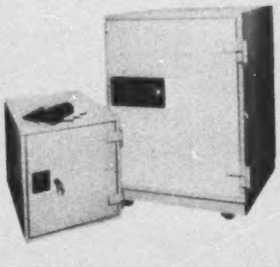

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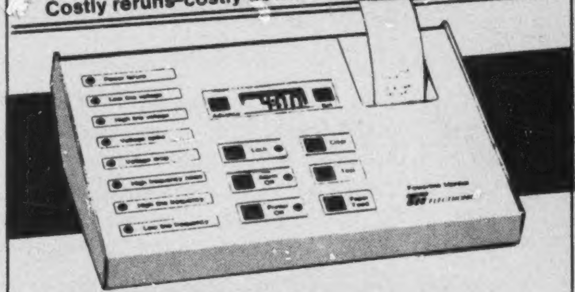

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